COAL MINING

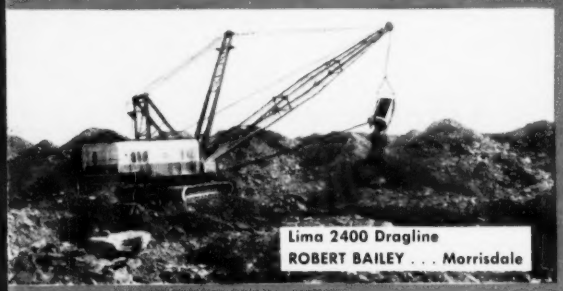
NOVEMBER, 1952 — published by Modern Mining Publishing Co. 4575 COUNTRY CLUB DRIVE • PITTSBURGH 27, PA. — VOLUME 29, No. 11

Weigh these 3 Highway facts... before buying mining equipment



Jaeger Model 185
R. C. CARLIN . . . Snow Shoe

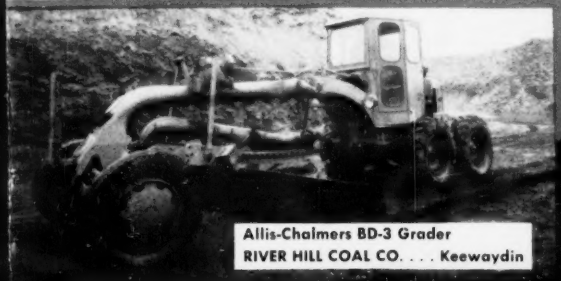
1. Highway representatives are trained equipment experts. They will gladly give you the benefit of their knowledge and experience.
2. Highway sells products of the nation's leading manufacturers.
3. Highway equipment is backed by "round-the-clock" parts and repair service . . . plus an iron-clad guarantee of quality.



Lima 2400 Dragline
ROBERT BAILEY . . . Morrisdale



Hough Payloader
TASA COAL CO . . . Zelienople



Allis-Chalmers BD-3 Grader
RIVER HILL COAL CO. . . . Keewaydin



Jaeger Pump
CARRIER & SON . . .
Brookville



Allis-Chalmers HD-20
S B & S COAL CO. . . . Fairchance

Highway EQUIPMENT COMPANY
6465 Hamilton Ave. • Pittsburgh, Pa.

ALLIS-CHALMERS • JAEGER • BAKER • GAR WOOD • HOUGH • MASTER • THOR • WAYNE CRANE • GENERAL MOTORS DIESEL ENGINES • LIMA SHOVELS, CRANES, DRAGLINES • ERIE BINS



Miners do more and like it!

. . . with easy-to-handle Le Roi-CLEVELAND 2-way air-feed sinker drills

Men get less tired!
Safety records improve!
Tonnages rise!

TAKE the hardest part of the work out of drilling and speed it up, too. Equip your miners with Le Roi-CLEVELAND HC10 Air-feed Sinker Drills — then watch tonnages per man-shift go up.

A lightweight column — pneumatic- or screw-type — supports the HC10. Setting-up takes only a few minutes. Feeding is done by air-pressure. All controls are handy.

Quick reverse feed makes it quick and easy to change steels. There are no swing or dump nuts to loosen or tighten.

The fast, light blows of Le Roi-CLEVELAND Air-Feed Sinker Drills are just right for carbide bits. You get maximum bit life — can use smaller bits for higher drilling speeds.

In addition to the popular HC10 model with 45-lb. drill, Le Roi-CLEVELAND Air-feed Sinker Drills are available in an HC23 model with $3\frac{1}{8}$" bore. Both models help your miners produce more footage and greater tonnages. And because the men don't get so tired, safety records improve.

Write today for complete information.

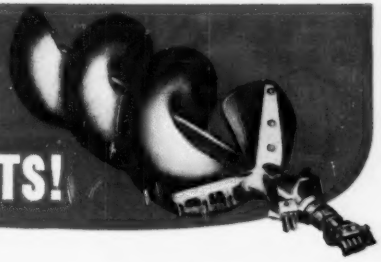
LE ROI

LE ROI COMPANY

RD-44

CLEVELAND ROCK DRILL DIVISION
12500 Berea Road, Cleveland 11, Ohio
***Plants:* Milwaukee, Cleveland and Greenwich, Ohio**

McCarthy Drills
CUT DRILLING COSTS!



BLAST HOLE DRILLS

Extra heavy-duty units compactly designed bore blast holes faster with less effort because of greater power and finger-tip hydraulic feed.

Choice of gasoline, diesel or electric power units drive interlocking-auger sections to any required depths through shale, sandrock, soft limestone and other earth formations.

Vertical and horizontal models are built for individual or cluster mountings on all types of mobile equipment. And there's a highly maneuverable, self-propelled unit specially designed for "close in" horizontal drilling.

Write now for full information on how these rugged work horses can help you hit pay dirt faster.

COAL RECOVERY DRILLS

McCarthy Coal Drills bite into the seam's heart to pull out clean, valuable lump or slack coal with minimum effort, minimum cost.

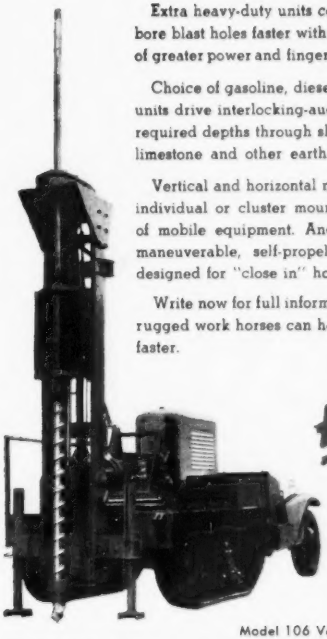
Near Salineville, Ohio three men use one machine with 24-inch diameter augers to produce 90 tons of coal daily. At Germano, Ohio the same number of men use 36-inch diameter augers to produce 167 tons per day!

The rugged McCarthy Mineral Recovery Drills produce coal at $1.50 to $2.00 per ton, including amortization of investment cost. These hydraulically controlled units operate on gasoline, diesel or electric power.

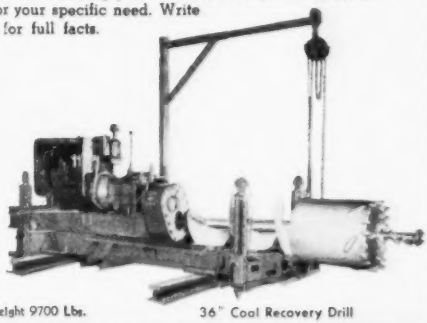
Choose from 4 models. 4 to 24-ft. interlocking-auger sections are available in 20, 24, 30, 36, 42 and 48-inch diameters. Jacks are power operated.

McCarthy dealers can show you many testimonials of installations and help you make the most profitable selection for your specific need. Write today for full facts.

Heavy Rugged Powerful



Model 106 Vertical Drill



Weight 9700 Lbs. 36" Coal Recovery Drill





MANUFACTURED BY

SALEM

THE SALEM TOOL CO.

200 SO. ELLSWORTH AVE. SALEM, OHIO, U.S.A.

Published monthly by Modern Mining Publishing Company. Publication Office—Advance Printing & Litho Co., Erie, Pa. Editorial and Executive Offices—4575 Country Club Drive, Pittsburgh, Pa., P. F. JASIK, Publisher & Editor. Price: In the United States, $2.00 per year; all other countries, $5.00. Single copy, 50 cents. Entered as second-class matter at the Post Office at Pittsburgh, Pennsylvania, under the act of March 3, 1879. Application for reentry applied for at the Post Office at Erie, Pennsylvania.

WHY "CAT" SCRAPERS *Lower* *YOUR* COST-PER YARD!



A "Cat" No. 80 Scraper with a heaped capacity of 20 cu. yds. (23 with side extensions) moves earth at low cost for Bowser & Echnoz, Kittanning, Pa.

BECKWITH MACHINERY COMPANY

6550 Hamilton Ave. - PITTSBURGH - Phone MOntrose 1-6900

BRANCHES			PARTS STORES	
ERIE, PA.	BRADFORD, PA.	CLEARFIELD, PA.	BELMONT, OHIO	FARRELL, PA.
1336 East 12th St.	361-369 Congress St.	Old Town Road	906 John St.	E. Broadway
Phone 4-2494	Phone 3166	Phone 5-9635	Phone BEthesda 4-4311	Phone Sharon 3572

BECKWITH SPECIFIED SERVICE

"CATERPILLAR" DIESEL TRACTORS, ENGINES, MOTOR GRADERS, EARTH-MOVING EQUIPMENT • HYSTER WINCHES & CRANES • TRACKSON SHOVELS, PIPE LAYERS • BUCYRUS-ERIE SPUDDERS AND SHOVELS • ATHEY WAGONS, MOBILOADERS, FORCE-FEED LOADERS • MARTIN TRAILERS • BRODERICK AND BASCOM WIRE ROPE • McKIERNAN TERRY PILE HAMMERS AND EXTRACTORS.

1 "Caterpillar" Scrapers are designed with a live-loading action that quickly boils material into every corner of the bowl.

2 Correct cutting edge design knifes through soil, sand or other material, requiring less power and effort on the part of the tractor.

3 Big tires float the loaded scraper through tough going. Ample clearance under the bowl reduces hang-ups. Smaller tractors can pull bigger loads in "Caterpillar" Scrapers.

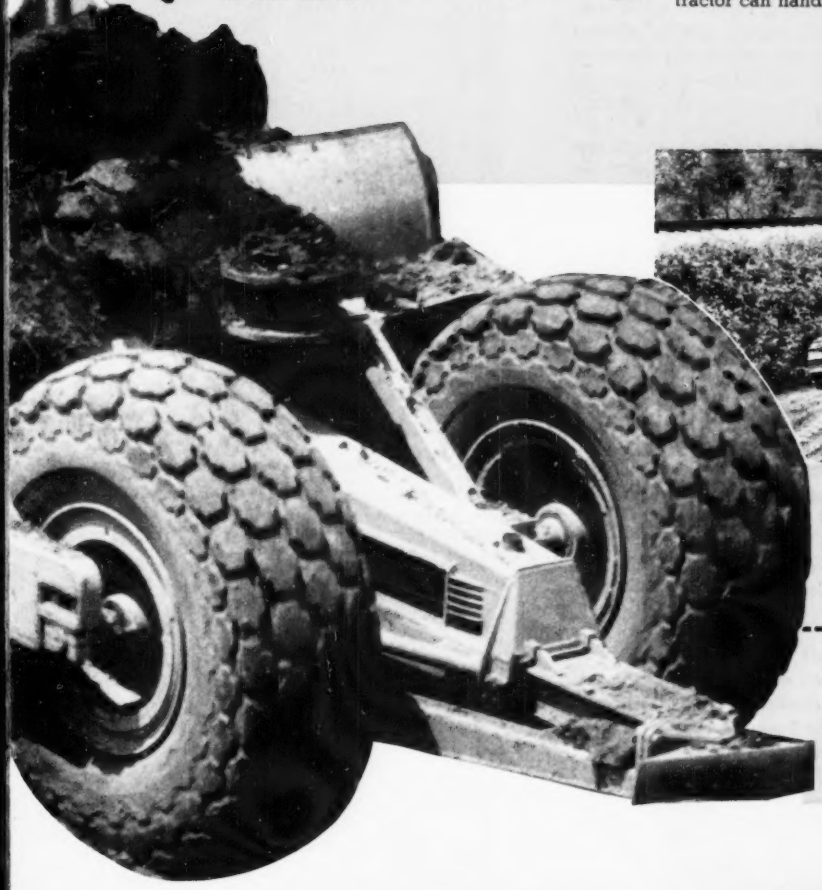
4 Low center of gravity keeps loaded or empty scraper riding safe and secure. Operators can use higher speeds on the haul and fill.

5 Apron lifts high enough to eject any material. Positive-type ejector moves to the front of the bowl, pushing all material in the load from the scraper.

6 "Caterpillar" Scrapers work with *any* tractor that has the required horsepower. They convert tractor power to efficient work power. Older tractors can be profitably used with a "Cat" Scraper.

7 "Caterpillar" Scrapers are backed by Beckwith Service — your assurance of full work schedules.

8 "Cat" Scrapers are available for early delivery — there's no waiting. You can now retire your obsolete rig that is not hauling as many yards per trip as the tractor can handle.





The "Cat" Scraper line ranges from the 27-yard No. 90 to the 4.5-yard No. 40 . . . offers a fit for every tractor size. These hydraulically controlled 40's are working on a railroad relocation project.

The new No. 90 — with a 27 heaped yard capacity (31 with top extensions) — has the big capacity that utilizes big horsepower. This rig is working for Harrison Construction Co. of Pittsburgh, Pa.

Call us and tell us where your present tractor is working, regardless of its make or age. Our sales engineers will be glad to look at it . . . will tell you what modern "Cat" Scraper model will work with it most efficiently . . . will tell you about the lower cost and the profit-making features of "Cat" Scrapers. Our phone numbers are listed at the left . . .



Stripping 200 ft.

at Malayan coal mine

19 LeTourneau units work 21 hours a day, 7 days a week

When the Malayan Collieries in Batu Arang, Selangor, resumed postwar operation, they had to completely re-equip their huge open pit, the only source of coal in the Federation of Malaya. In 1945, they purchased 12 bottom-dump Tournatrailers to haul overburden. These rubber-tired LeTourneau units proved so efficient that when the company wanted to increase output still further, they added 4 rear-dump Tournarockers, 2 Tournapulls, and a Tournadozer to their fleet.

Loaded by shovel or dragline, the rear-dump Tournarockers haul up to 18 tons of oil-bearing shale on each trip to the dump. With a top speed of 35 m.p.h., the Tournarockers make more trips per hour than any comparable haulers.

The Tournapull-Scrapers are equally fast. On typical ½-mile hauls, these units *average* 15 m.p.h. between loading area and dump. Originally, the Tournapulls took 2½ to 3 minutes to self-load to struck capacity (11 loose yds.) in the loose shale. Now, push-loaded by the Tournadozer, the Tournapulls heap 14 loose yds. in 35 to 40 seconds. In other words, load time has been reduced 70 to 80%, while load size has been increased 25%.

In addition to push-loading the scrapers, the fast rubber-tired Tournadozer handles a number of widely-scattered dozing assignments, cleans up around shovels, levels stockpiles, and clears dump areas. Because it drives on rubber tires instead of tracks, this unit does not damage paved surfaces. With 19 m.p.h. speeds, it makes job-to-job moves 3 to 5 times faster than crawler tractors.

All 19 LeTourneau units work 21 hours a day, 7 days a week. Maintenance has been low despite this heavy schedule. Construction of the machines *eliminates entirely* such trouble sources as crawler tracks, body frames, sub-frames, springs, and complicated hydraulic systems. There are few places to grease, only two types of oil to use.

Compare your present equipment with modern LeTourneau units. Then, to check your profit possibilities, your LeTourneau Distributor will furnish added facts.



Tournapull is push-loaded to heaped capacity by Tournadozer in 35 to 40 seconds. Once loaded, the Tournapull travels ½ mile to dump, spreads and returns ½ mile to the cut, all in less than 5 minutes.



L.T. LeTOURNEAU EQUIPMENT

FURNIVAL
Machinery Company

Lancaster Ave., at 54th St.
PHILADELPHIA 31, PA.

5105 Paxton Street
HARRISBURG, PA.

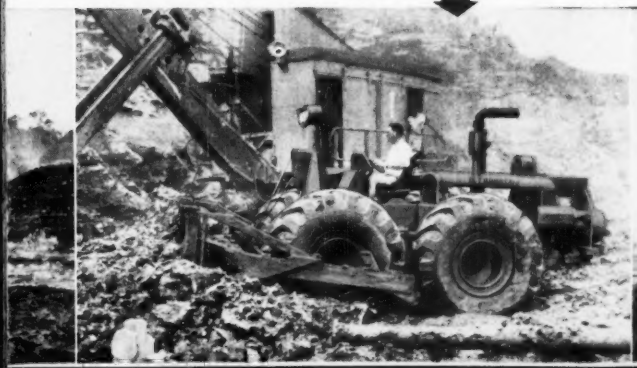
Water St., NEW PHILADELPHIA, PA.
(Pottsville Region)

of shale overburden



While bottom-dump Tournatrailer backs into position, Tournarocker in foreground is loaded by 2½-yard dragline. This is only one of 4 levels at which shale overburden is being moved to reach a coal seam which averages 30 ft. in depth. At one point, 200' of overburden has to be removed to reach the coal.

Tournadozer cleans around shovel; when not busy here, levels dump areas, push-loads scrapers. Its simple electric controls are easy to operate, reduce training time. In 4 min. rig can be at next assignment a mile away.



Tournarocker dumps load of shale overburden completely over edge of bank. Unit has been assigned most difficult hauls because of its ability to pull through mud and up steep grades. 13'9" turn radius speeds positioning.



Tournapull, Tournadozer, Tournarocker, Tournatrailer Trademark Reg. U.S. Pat. Off. G-185-CM

A. T. GREEN Machinery Company
Route 8
GLENSHAW (Pittsburgh), PA.

BALDWIN Machinery Co., Inc.
1549 Hansford St.
CHARLESTON, W. VA.

307 North Avenue
CLARKSBURG, W. VA.

Allis-Chalmers HD-20 Tractor

gives HIGHER OUTPUT—

Exclusive Hydraulic Torque Converter Drive Is One BIG Reason Why

The hydraulic torque converter drive, *exclusive* in the Allis-Chalmers HD-20 Tractor, brings you productivity, handling ease and dependability that makes every hour, every day of the season count . . . gives the operator the equivalent of hundreds of gear ratios in two speed ranges . . . automatically selects the proper speed for maximum production.

Dozing — With hydraulic torque converter drive you take full advantage of available horsepower . . . roll bigger loads, tackle tougher dozing jobs. Master clutch engages under cushioned protection, yet power is achieved *instantly* with velvet-like smoothness. This means fewer repairs . . . longer life of tractor and auxiliary equipment.

Pulling — There's nothing like the HD-20 for sheer productive power. Torque converter actually multiplies torque up to four and one-half times . . . develops tremendous drawbar pull to start the load smoothly, and automatically accelerates to highest speed conditions permit, in either high or low range.

Excavating — With full horsepower available even at creeping speed, and shifting virtually eliminated, the operator can concentrate on his front-end shovel completely . . . crowd surely and steadily . . . start and stop with a touch of the throttle.

Pushing — The HD-20 makes smoother contact, automatically matches speed to pushed equipment, maintains steady contact while loading, sends load off to the fill in a higher speed.

Get the full story now from your Allis-Chalmers dealer. See why the HD-20 does more work, more easily, at less cost . . . and why it is worth waiting for.



ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Weight: 41,000 lb.
175 Net hp.
at flywheel


With LESS UPKEEP
Originator of the Torque Converter Tractor

COAL MINING

Vol. XXIX November, 1952 No. 11

Contents

Do You Know 11

Here and There in the Coal Industry 11

Annual Conference on Economic Research Held at West Virginia University 14

New Continuous Mining Machine 17

37th Annual Meeting of the Coal Mining Institute of North America 22

Advertiser's Index 35

Published Monthly By

MODERN MINING PUBLISHING COMPANY

Publication Office—1118 Chestnut St., Erie, Pa.

Editorial Offices—4575 Country Club Drive, Pittsburgh, Pa., Phone Pl. 1-9411.

P. F. JASIK, Publisher and Editor

Twenty-four Hour Service

SKF Hyatt Bantam Torrington Aetna Auburn Medart-Timken Bunting Bronze Browning V-Belt Drives

FOR BEARINGS CALL HARRIS

New Departure Bower Orange Shafer B & R B American Kilian Victor Seals Lincoln Lubrication

HUbbard 1-4400

Bearing Division

HARRIS PUMP AND SUPPLY COMPANY

Brady and Sidney Streets, Pittsburgh 3, Pennsylvania

Manufacturers and Lubrication Engineers Since 1890



Lubrication Engineering follows an established, definite pattern of studying the Machine and recommending a lubricant to meet the situation.

Let our engineer discuss with you the NEW DEVELOPMENT IN HYDRAULIC lubrication.

STIFFLER INDUSTRIAL LUBRICANTS CO.

Etna, Penna. Phone St. 1-1571 and 1-2660

PROMPT SERVICE

on repair and replacement parts for your

MINING EQUIPMENT!

Our completely integrated foundry, machine and fabricating shops are your assurance of quick, efficient service.

FORT PITT Mining Equipment

NEW • REPAIRS • PARTS

We manufacture: Hoists - skips - cages - coal, slate and rock larries - rotary dumps - conveyors - coke oven and tipple equipment.

Connellsville Manufacturing and Mine Supply Company

CONNELLSVILLE PENNSYLVANIA

Serving the Mining Industry Since 1901

ROOTS & DOZES

IN THE SAME PASS...

ESCO introduces NEW BUCK FORTE ROOTER



Model view. Four adjustable rooting depths: 9", 15", 21" and 27".

REMEMBER the name—Buck Forte Rooter—especially designed to root and doze on the same pass. This dual feature of operation has enabled operators, working with a pair of Buck Forte Rooters, to up their dozer yardage over 50%. *That's a job-proven fact.*

It gives you these advantages:

LIGHT IN WEIGHT. Less than 1,000 lbs. No special handling equipment required. Can be transported on the tractor.

LOW COST. The Buck Forte Rooter costs 75% less than conventional rooters.

TOUGH AND DEPENDABLE. Equipped with *ESCO* alloy steel shank and renewable box type points, it has proved itself in concrete, rock and hardpan.

EASILY INSTALLED. One man can install or remove the rooter in minutes with no cutting or welding on dozer.

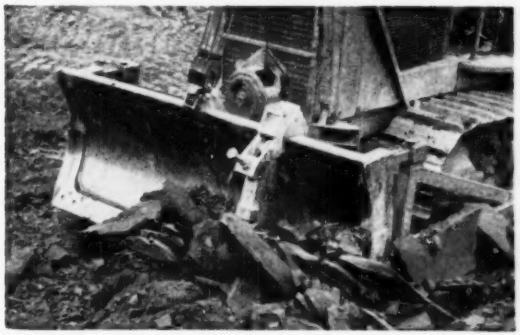
ADJUSTABLE. Four adjustable rooting depths—9", 15", 21" and 27".

FITS ALL LARGE, STRAIGHT DOZERS. Can be used in pairs or singly.

Get more information on the new Buck Forte Rooter—Just see your ESCO dealer or fill in and mail the coupon.



Rooter mounted on dozer blade. Second rooter is usually installed to double effectiveness.



Buck Forte Rooter on a straight dozer rooting unshot sedimentary ocean rock for aggregate plant.

ESCO DRAGLINE BUCKETS, DIPPERS AND HOE DIPPERS

DISTRIBUTED BY

KANAWHA STEEL & EQUIPMENT CO.

Corner Young and Welch Streets CHARLESTON, WEST VIRGINIA
Mail Address: P.O. Box 2361

BRANCH OFFICE

24th Street and U. S. Route 22 WEIRTON, WEST VIRGINIA
Mail Address: P.O. Box 687

FROM PIT TO TIPPLE

"EUCS" haul MORE TONNAGE at LESS COST



Rear-Dump Euclids of 10 to 34-ton payload capacity have a wide range of body designs . . . they're unmatched for efficiency on the haul road and dump . . . with travel speeds up to 35.7 m.p.h. . . . powered by diesel engines of 125 to 400 h.p.

Combining rugged construction, large capacity and fast loaded travel speeds, Rear-Dump "Eucs" and Euclid Bottom-Dump Coal Haulers provide high production and low cost hauling in open pit mines. Designed to work with large loading equipment, "Eucs" are built for heavy duty off-the-highway service.



Ask your Euclid Distributor for a cost estimate on jobs similar to yours. Euclids are your best bet for hauling coal from pit to tipple.

Euclid Bottom-Dump Coal Haulers are built as a complete unit, with proper weight distribution, plenty of power and ease of handling. Powered by diesel engines to 300 h.p. . . . loaded speeds up to 34.4 m.p.h. . . . available in 20 to 40-ton capacities.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

Do You Know?

● Little known metals called "rare earths" may soon be extensively employed in improved alloys because they are becoming more available as by-products of the atomic energy pile, and by new chemical methods of separation recently developed.

The biggest potential new market for the rare earths is in steel-making. Dr. Clyde Williams of Battelle Memorial Institute, Columbus, Ohio, recently stated. They may also play important roles with aluminum and magnesium. The rare earths, he said, improve resistance of the primary metals to oxidation and corrosion at high temperatures, impart strength, cut down impurities, or make the primary metal easier to work into desirable shapes.

There are 14 rare earth metals in the periodic table of chemical elements but there are four others closely associated with the 14. One of them, thorium, is of special interest to the Atomic Energy Commission because it has possibilities of becoming important as a raw material for atomic energy.

The so-called rare earths are not so rare, but they are little known and little used outside of scientific circles because they are hard to separate from each other and from the ores in which they occur. Cerium is the best known and at present the most widely used. Because it ignites easily, it is employed as an active ingredient in the so-called flints of cigarette lighters. Of greater importance, however, is its use in an alloy containing magnesium and zirconium used in jet-engine parts.

These rare earth metals as yet have no simple names. The 14 include cerium, promethium, praesodymium, neodymium, samarium, europium, gadolinium, terbium, dysprosium, holmium, ermium, thulium, ytterbium and lutecium. The associated four are lanthanum, ytterbium, scandium, and thorium. Some of these names commemorate the places where they were discovered.

Commercial production of the rare earths has been handicapped by the fact that they are much alike chemically. New chemical methods for separating them are promising. In these, the ores are put into solution, and the solutions passed through beds of what scientists called "ion-exchange" resins. In the resins, the rare earths are absorbed one by one.

● A tiny crystal with a whopping big memory shows "considerable promise" as a new device for storing information for computors and switching systems, delegates to the Fall General Meeting of the American Institute of Electrical Engineers were told here today.

J. R. Anderson of the Bell Telephone laboratories reported that barium titanate seems to have the best memory-storage qualities of the different crystals tested.

In experiments carried out at the laboratories, he said, as many as 2,500 bits of information have been stored in a square inch of a crystal's surface only a few thousans of an inch thick. The information can be deposited there with electonic impulses less than a millionth of a second long, and the information will stay there for a long time.

Here and There in the Coal Industry



Joseph Bierer has been appointed acting Director of the West Virginia Department of Mines, replacing Arch Alexander.

● In testimony of the value of cooperative safety endeavor, the fatality record of the bituminous coal mining industry shows gradual and continued improvement. The per million ton fatality rate for the January to September period of 1952 showed a 9% decrease when compared with the same period of the previous year. The respective rates were .99 and 1.11. Underground, surface and strip mine fatalities decreased 84 in these respective periods. When predicted on the per million man-hour base, the fatality rate shows an improvement of 10% for the January-July 1952 period over the January-July 1951 period, July being the last month for which the per million manhour rate figures are available.

July, 1952 employment in the bituminous coal industry totaled 339,600 men with tons per man day averaging 6.921.

The promotion of safety is a continuing job, each segment of the industry having its very definite responsibilities and its reasons for being proud of present accomplishments. The continuing reduction of accidents is the goal that is always ahead and is continually being accomplished.

● Contracts have been signed for the fuel requirements at the two steam-electric power plants to be built in the Ohio Valley to serve the new atomic energy center near Portsmouth, Ohio.

The contracts, which are of 15-year duration, call for more than 7 million tons of coal a year. Five companies participate in the contracts.

At the Madison, Ind. plant, Ayrshire Collieries, Indianapolis (Republic Coal and Coke Co. agent) will supply 1,780,000 tons. A like amount will be supplied by Sinclair Coal Co., Kansas City. The Green Coal Co., Owensboro, Ky., will furnish 395,000 tons.

The suppliers to the new plant near Gallipolis, Ohio will be Pittsburgh Consolidation Coal Co., Pittsburgh, and North American Coal Co., Cleveland, each furnishing 1,550,000 tons a year.

Deliveries on the contracts will begin in October, 1954.

● John A. Kelly, Chairman of the Board of the Guyan Eagle Coal Co. and an executive in a number of other producing companies in the Logan District, died suddenly at his home in Huntington, W. Va. on October 4. Funeral services were held in Huntington on October 7 and were attended by a large number of persons from the coal industry.

Mr. Kelly was 69 years old. He first entered the coal industry in 1901 when he was employed by the Tierney interest at Powhatan, W. Va. During his career he was affiliated with or organized a number of companies including the Buffalo-Chilton Co., the Elk Creek Co., the Kelly-Hatfield Land Co., Prockter Coal Co., and the Main Island Creek Coal Co.

● The Jamison No. 11 Mine team of the South Union Coal Co. won first place in the Monongahela Valley Coal Mining Institute first aid meet, with 12 teams in the contest. Second place went to the Booth No. 6 Mine of the Christopher Coal Company and third place went to the team representing the Arkwright Mine of the Christopher Coal Co.

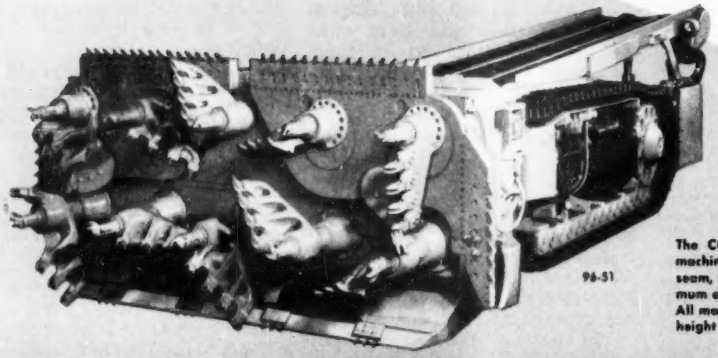
● L. Newton Thomas, President of the Carbon Fuel Company, Charleston, West Virginia, was elected director of the National Coal Association, succeeding D. H. Morton, President of the Winifrede Colieries, of Charleston, West Virginia, who resigned because of the demand of other interests.

JEFFREY...

MOLVEYOR-COLMOL



309-52



96-51

The COLMOL is a continuous mining machine which advances into a solid seam, removing all coal from a minimum area 9½ feet wide by 3 feet high. All machines have a 12" adjustment for height and are available in different heights up to 72".

THE JEFFREY MANUFACTURING COMPANY

Established 1877

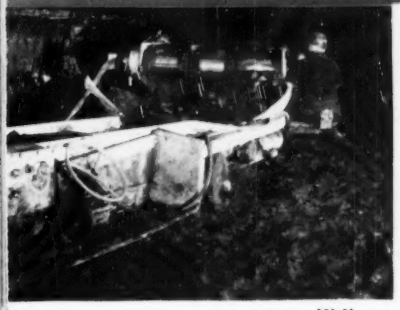
912 North Fourth St., Columbus 16, Ohio

1877 75 YEARS 1952

Baltimore 2, Beckley, W. Va., Birmingham 3, Boston 16, Buffalo 2, Chicago 1, Cincinnati 2, Cleveland 15, Denver 2, Detroit 13, Forty Fort, Pa., Harlan, Ky., Houston 2, Jacksonville 2, Milwaukee 2, New York 7, Philadelphia 3, Pittsburgh 22, St. Louis 1, Salt Lake City 1

Jeffrey Mfg. Co. Ltd., Montreal, Canada
British Jeffrey-Diamond Ltd., Wakefield, England
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S. A.
The Galion Iron Works & Mfg. Co., Galion and Bucyrus, Ohio
Galion (Great Britian Ltd.), Wakefield, England
The Ohio Malleable Iron Co., Columbus, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

Continuous MINING SYSTEM



151-51

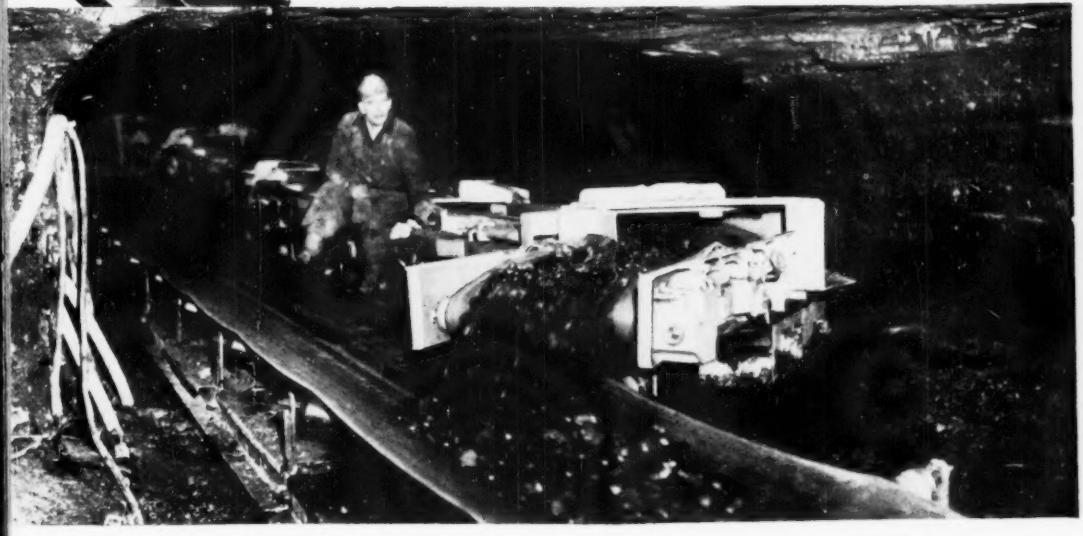
● The MOLVEYOR is comprised of receiving end section, a discharge end and any number of intermediate sections and provides a flexible high productive method of transporting coal from face to main haulageway. Receiving end section can be attached to COLMOL and designed to advance with it—or can be operated from receiving end when not connected with the COLMOL.

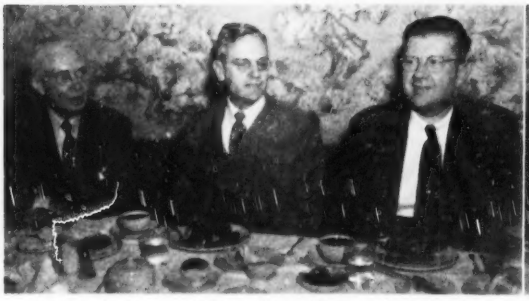
Discharge end section delivers coal continuously to belt haulage system.

15 foot Belt Section
Belt motors — 2 H.P.
Each unit has an ½ H.P. traction motor
Can be operated as a complete unit up to 350 feet — or longer
Tramming speed ..... 33 feet per minute
Belt width ..... 24 inches
Belt Speed ..... 300 or 400 feet per minute
Capacity ..... 3 or 4 tons per minute

Contact a Jeffrey Engineer relative to adaptation of this system to your mine.

160-51





Left: W. L. Patton, V-Pres. Truax-Truaer Coal Co.; Irwin Stewart, Pres. West Virginia University; C. J. Potter, Pres. Rochester & Pittsburgh Coal Co.



Left: Joseph Pursglove, Jr., V-Pres., Pittsburgh Consolidation Coal Co.; L. C. Campbell, V-Pres., Eastern Gas and Fuels Associates;; R. G. Lazzell, Asst. to Pres., Island Creek Coal Co.

Annual Conference on Economic Research Held at West Virginia University

The Annual Conference on Economic Research in the Bituminous Coal Industry, under the auspices of the West Virginia University College of Commerce was held in the Armstrong Hall, University of West Virginia, Morganatown, October 10.

The afternoon session was held at 2 P. M. with R. W. Coleman, Dean, College of Commerce, presiding. "Analysis of Economic Factors in Coal Production Management," presented by L. C. Campbell, President of the Eastern Gas and Fuel Associates and President of the National Coal Association was the first paper on the program. This paper is reproduced in the following pages.

The second paper "Evolution of Important Elements in Coal Marketing Utilization," was presented by M. L. Patton, V.-President, Truax-Traer Coal Co. and dealt in problems pertaining to coal markets and to the sale of coal.



Dean Colesman conducted the conference

A paper, "Appraisal of Problems and Responsibilities of Coal Company Executives," was written by J. J. Foster, Assistant to President, Island Creek Coal Company, but was read by R. G. Lazzell another assistant to the V.-President of that company.

A dinner session was held that evening in the Coral Room of the Morgan Hotel with C. J. Potter, President of the Rochester and Pittsburgh Coal Company in charge. A summary of the conference was made at the dinner by Joseph Pursglove, Jr., V.-President of the Pittsburgh Consolidation Coal Company.

These conferences have been held for some years now. This year only about 20 per cent of the bituminous production was represented. Considering the importance of a conference of this kind, this meager representation reflects a bad situation in our industry. It is hard to believe that only 20 per cent of our present directing personnel is intelligent enough to understand the meaning and the necessity of Economic Research.



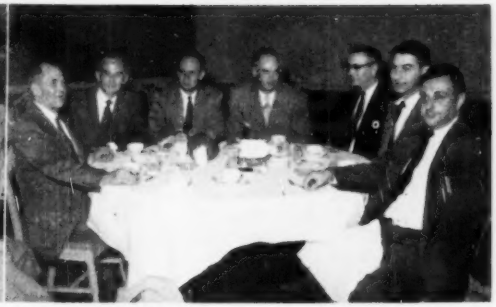
Left: Ford K. Edwards, National Coal Assn. Robert Bower and W. E. Jones of the Gates Rubber Co.; L. A. Connor, Supt. and E. W. St. Clair, Gen. Supt. of the Trotter Coal Co.; Roy E. Dean, Ayershire Collieries.



Left: H. S. Pursglove, W. L. Pursglove Coal Co.; Carl Marshall and E. Critchfield, Fairmont Coal Bureau, J. G. Kidwell, Haywood Coal Co.; A. W. Hawley, Preston County Coke Co.; R. M. Davis, Davis-Nelson Coal Co.; Paul H. Price, State Geologist.



Walter L. Sifer, Bituminous Coal Institute, Thomas E. Campbell, Asso. Professor of Economics, and Quin F. Curtis of the West Virginia University; Roy R. Brown, Supt., Maiden Mine. Monroe J. Mechling, Safety Director, The Valley Camp Coal Co.; Roy C. Estep, Supervising Inspector, U. S. Bureau of Mines, Fairmont, W. Va.



Left: G. R. Spindler, Professor, West Virginia University; D. L. McElroy, V-Pres. Engineering, Pittsburgh Consolidation Coal Co.; A. S. Gilliam, C. R. Nailer, V-Pres operations, Christopher Coal Co.; M. B. Wright, J. S. Gilliam, Frank R. Zacher, Gen. Supt., Christopher Coal Co.

"PRODUCTION ECONOMICS OF BITUMINOUS COAL"

By L. C. CAMPBELL
Vice-President, Eastern Gas and Fuel Associates

Before the Annual Conference Sponsored by the Dept. of Economics and Business Administration, West Virginia University, October 10, 1952

Dean Coleman was very kind to invite me to appear on this program, but I wonder whether he looked into my academic affiliations before asking me to come down to Morgantown on the eve of the Mountaineer-Nittany Lion game? Now that I am here, I'll be honest with you and identify myself as a graduate of Penn State! As a matter of fact, I think that this long athletic relationship has helped strengthen the bonds of friendship and cooperation between these two schools. It is significant, too, that both these institutions have mining engineering departments that rank very high among the world's best.

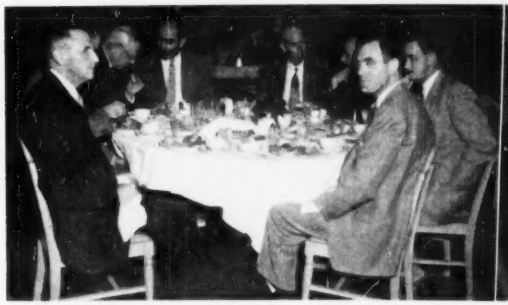


L. C. Campbell presenting his paper, "Production Economics of Bituminous Coal."

I have a degree in mining engineering and have been an operating man since I first entered the coal industry shortly after World War I. I have seen coal towns grow from bare hillsides and creek bottoms, almost inaccessible to commerce and communion with other areas, into thriving, self-contained economic centers. With this transformation have come some revolutionary changes in the production of coal, and further developments will be very pronounced in the period ahead. To help the coal industry carry out its vital function in the nation's continued progress, increasing reliance must be placed upon research — research that will develop more ef-



M. L. Patton reading his paper "Evaluation of Important Elements in Coal Marketing and Utilization."



Left: R. W. Coleman, Dean, West Virginia University; J. L. Ziercher, Pittsburgh Consolidation Coal Co.; B. H. Campbell, G. A. Lamb, Leo Fishman, John W. F. Rudnicki, Arthur E. Belton.



J. E. Stewart, Jr., Pittsburgh Consolidation Coal Co.; Harold Suter, Christopher Coal Co.; C. P. Stewart, Sr., Pittsburgh Consolidation Coal Co.; Mel Ireland, Christopher Coal Co.; Geo. L. Judy, Consolidation Coal Co.; J. B. Cordiner, U. S. Bureau of Mines.

ficient machines and methods in the utilization of coal, and research that analyzes markets, anticipates future requirements, and suggests the procedure by which all activities can be geared to the best advantage of all concerned, which necessarily includes the customer, the employee and the producer.

Other speakers are here to discuss economic research as it relates to marketing and utilization. I shall confine my remarks to the production side of the coal business, where economic research is the instrument of scientific planning that serves as a control by which all phases of management's efforts may be coordinated. If I occasionally disregard this limitation, I trust that you will recognize the fact that the position of the coal industry in our competitive system is not so unique as to permit an economic analysis of any one phase of the business to the complete isolation of the other phases.

The problem of the operating man is to operate with safety and at costs which will permit a margin of profit. The burden of making a profit has become heavier and heavier in recent years, for the coal industry has been unable to offset rising costs with increased price. Most other industries have done so. In the case of coal under competitive conditions that have existed, our price situation has been exceedingly difficult. The fact is that coal in many markets is selling today at less than it sold for a year ago, while the cost of mining coal and the cost of its preparation, as well as the cost of moving it to market, have been steadily upward.

Since the start of the war in Korea in June of 1950, and the development of the program of production for defense which followed, the increase in price in many products has been very marked—but not so with coal. Yet, in this period there has been one substantial wage increase in January, 1951, to which must now be added the even more burdensome increase of October 1, 1952. Sharp rises in the cost of equipment, and increases in rail rates on coal have also occured. The economic life of many coal mines is indeed now at stake unless the producer can find means of reducing operating costs. The American mining industry has made tremendous strides over the years in production economics through one means or another. Research of all of the attendant problems has done much to afford America the abundance of coal supply which it enjoys.

In spite of these efforts, we often find ourselves mining coal on a non-profit basis or even worse. That is not necessarily because the industry wants it that way, for it must know that few coal mines are going to stay in business very long unless they earn a small profit. It is ironic that continuity of coal supply, which has for so many years been the aim of the industry for the benefit of its customers and employees, may have now confronted the coal business with the most difficult economic impasse in generations. It remains to be seen whether the imposition of succeeding wage agreements to attain this continuity of supply is warranted in the eyes of the customer now that he has a veritable mountain of coal supply at hand.

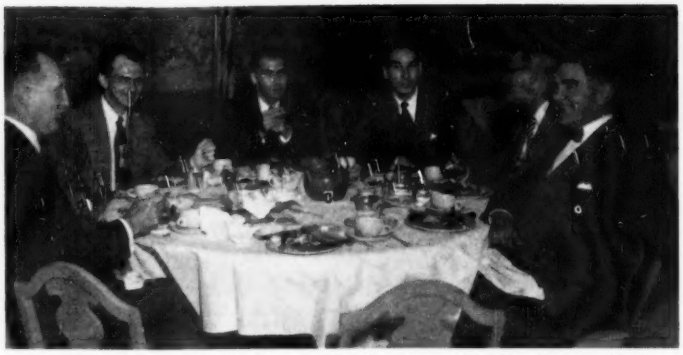
One of the questions which the operating manager faces is the extent to which mine realization should be the standard or criteria of successful operation. I shall not attempt to answer that question in these remarks. I simply offer it to you as a fruitful field for study and discussion in realization that the job of economic research as it perhaps pertains to lower cost production is ever with us.

We know that wages are the largest item of mining costs. When prices cannot be increased to offset a wage increase, we say we must attempt to reduce costs. Indeed, we know we must find a way to reduce costs, but how?

The operator, who has several mines, will no doubt study his cost figures for different mines, for different sections of the same mine. Perhaps he will close some sections, or some mine—if there be several—and expand his output at others where the unit cost is lower. He will consider ways and means of increased mechanization, looking to increased productivity.

But what happens to the producer with the single mine and an operation that does not justify

(Continued on Page 26)



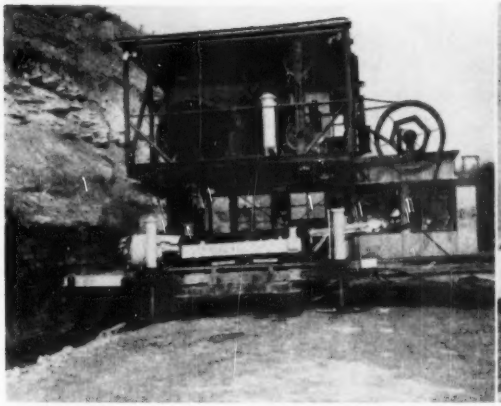
Dan Cronin, Fairmont Coal Bureau; Donald Gaspar, Pittsburgh Consolidation Coal Co.; Gerald Somers, and Jere Clark of the West Virginia University; H. O. Draper, J & L Steel Corp.; Joe B. Feather, Pittsburgh Consolidation Coal Co.



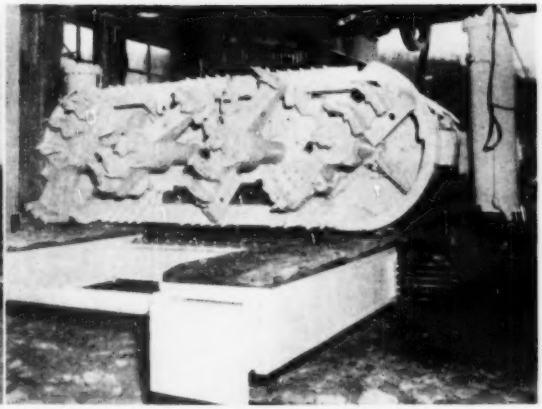
J. C. Potter conducting activities at the evening dinner.



Joseph Pursglove, Jr., summarizing the afternoon session.



Here is the rig with the four hydraulic jacks raised to the proper height for the mining machine to begin the first cut of a new boring. Note the power cables coming down to the machine from the reels on the second deck.



The "business end" of the machine has four overlapping cutting heads, and fixed cutter blades at the top and bottom. Behind the outer two heads you can see the paddles that move the coal flight conveyor.

New Continuous Mining Machine

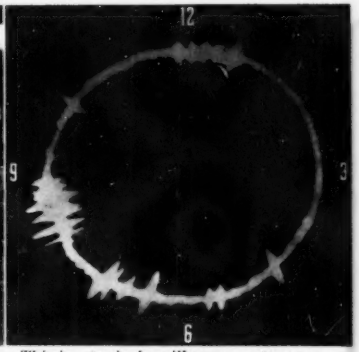
The new continuous coal mining system developed by Carbide and Carbon Chemicals Company is designed for handling coal in outcrop seams. For this type of seam, preparation for coal removal is relatively simple. A working shelf is cleared at the level of the outcrop, and the mining rig takes over.

THE MINING RIG

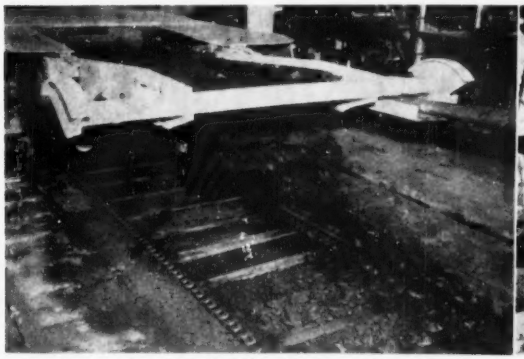
The mining rig is a self-propelled, double-decked steel structure. On the first deck is a runway or launching platform for the



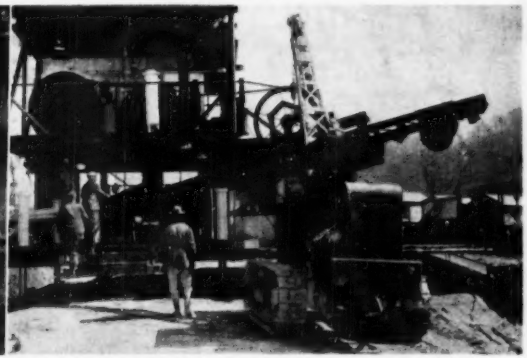
Electric sensing devices called "stratascopes" are mounted on the outermost cutting teeth of each of the outer two cutting heads. They help the operator steer the machine by telling him which strata in the coal seam are being cut, and the relation of these strata to the center of the hole.



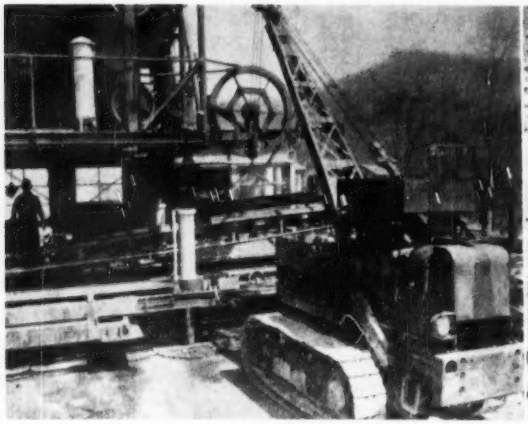
This is a typical oscilloscope pattern registered by the stratascope when the mining machine is making a normal coal cut. At 1 o'clock is a slight "blip" as the tooth cuts the first coal in the roof. Going to the left, between 11 and 12, the tooth is in shale. Between 8 and 9 o'clock it has struck very hard bone coal. And between 6 and 7 o'clock the deflection is made by hard, thin sections of coal. Finally, at 5 o'clock, it leaves the cutting area as it enters the space but by the adjacent head.



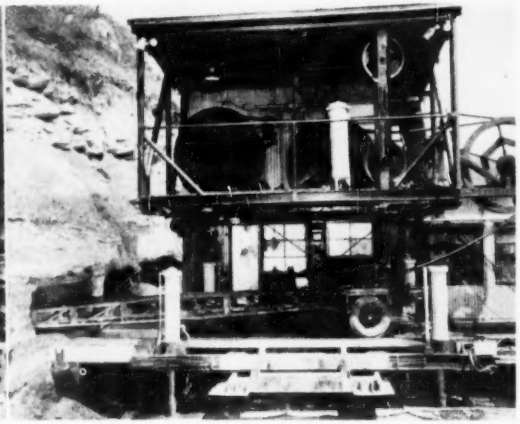
The first cut has just started, and a few cuttings drop from the central flight conveyor of the mining machine to the rig conveyor.



One of the 30-foot-long portable conveyors is swung into position on the launching platform.



The portable conveyor is held in this "ready" position until the machine conveyor or the portable conveyor ahead reaches the end of the rig conveyor. Then it can be added to the train with only a couple of minutes delay in production.



The mining machine and the front end of the first portable conveyor are underground. The machine power cables ride in L-shaped hooks at the far side of the conveyor.

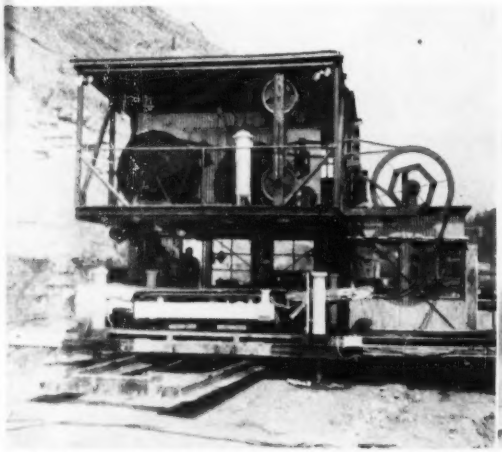
mining machine. In the center of the runway is a coal conveyor. Adjacent to it is a control panel for moving the whole rig, and an enclosed cab that houses the remote controls for the mining machine. On the second deck are the cable reels for the power and control cables that guide the machine and electric switch gear.

This whole structure is mounted on four hydraulic jacks, which can be adjusted so that the launching platform is at the proper height for the mining machine to enter the seam. In order to move along the face of the seam, these jacks are raised enough to allow rails suspended from the undercarriage to be rolled out by an electrically-driven winch. The jacks are let down until the rig rests on wheels on the rails and the four hydraulic jack pads are off the ground. Then the winch pulls the rig over to the next position. If the exposed face is irregular, the rails can be pivoted until the platform is at the correct angle. When the platform is in position, the hydralic jacks are raised to support it at the proper height.

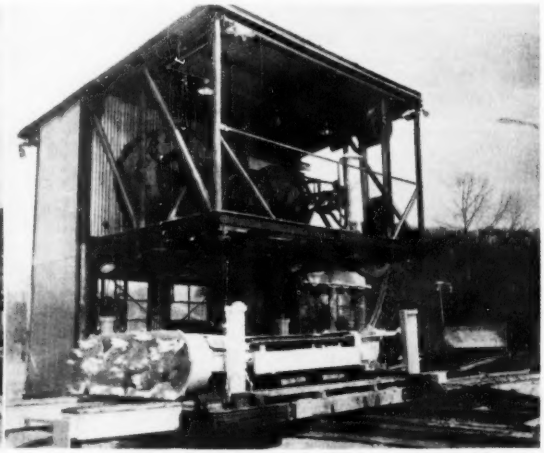
THE MINING MACHINE

The mining machine is mounted on crawler tracks, which are driven by a variable speed electric motor. Its "business end" consists of four overlapping cutting heads with cutting teeth that are tipped with tungsten carbide. The sections between the holes cut by these heads are shaved off by fixed cutter blades just slightly to the rear of the heads. Between them, the heads and the blades make a smooth, even hole about 10 feet wide and 3 feet high. Of course, by making successive cuts, the full height of the seam can be mined.

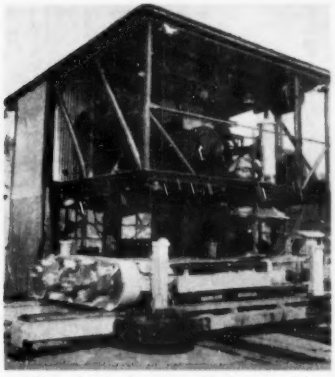
Behind the outer cutting heads revolving on the same shaft are paddles that move the coal cuttings to the middle, where they are



To move over to a new position, rails suspended from the undercarriage are rolled out. They are controlled from the panel in the background at the left of the first deck, and the mining machine is controlled from the enclosed cab at the right.



At the new position the rig is being raised to the proper height by the hydaulic jacks.



With the jack pads off the ground, the rig is pulled along the rails to the next boring by a cable and power winch.

picked up by the central flight conveyor and carried from the front to the rear of the machine. From the fixed cutter blades back, the whole cutting end is encased in a metal shield, so that the coal can escape only by means of the machine conveyor.

STEERING THE MACHINE

Electric sensing devices called "stratascopes" are mounted on the outermost cutting teeth of each of the outer two cutting heads. In the control cab, the stratascopes are coupled to two polar oscilloscopes having circular screens somewhat like a radar screen. Each makes a circle of light to trace the paths of the two sensitive teeth. Every time the stratascope teeth cut through anything harder than the normal coal in the seam, they cause irregularities — or "blips"—in the light circles. They indicate which strata in the coal seam are being cut, and the relation of these strata to the center of the hole.

Since the strata in a coal seam bear a more or less fixed relation to each other and to the extremities of the seam, the oscilloscopes give the operator the information he needs to steer the machine on a predetermined course. Then, from his cab on the launching platform, the operator guides the machine up or down to follow the coal seam. He can correct any tendency the machine may have to "spiral," and steer it to make a straight hole, or to follow the adjacent hole at any desired distance.

THE OPERATIONAL SEQUENCE

To begin mining, the rig carrying the machine on its launching platform, is located at the proper angle and height. If the launching platform does not abut the seam face, the gap is bridged by extending two telescoped sections of the runway. The operator starts the cutting heads and conveying system, and then moves the machine ahead on its crawler tracks. First, the pilot drill taps the coal and starts sinking the pilot boring. In a few moments, the main cutting heads reach the seam and begin to bite. They crack the coal into small pieces that are pushed by the paddles and carried up through the middle of the machine on the conveyor.



The continuous stream of coal flows from the rig conveyor to a short transfer conveyor, which feeds the elevating conveyor of the truck-loading hopper.



The hopper, and let-down conveyor system that takes the coal to the storage pile at the foot of the hill.



One of the trucks dumping coal into the hopper at the let-down conveyor.

At the rear of the machine, the coal falls from the central flight conveyor to the conveyor in the launching platform. The continuous stream of coal flows along the rig conveyor to a short transfer conveyor, which feeds the elevating conveyor of the truck-loading hopper. From this point, it travels by 20-ton trucks to the hopper at the let-down conveyor to the storage pile.

THE PORTABLE CONVEYORS

When the mining machine is almost underground, the rear of its central flight conveyor reaches the end of the platform conveyor. At this point, the machine is stopped

(Continued on Page 28)



COMPTON AUGER

Improves product and cuts cost of
STRIP MINE OPERATIONS

The Compton Auger introduces an entirely new and unique method of recovering high wall coal at phenomenally low costs.

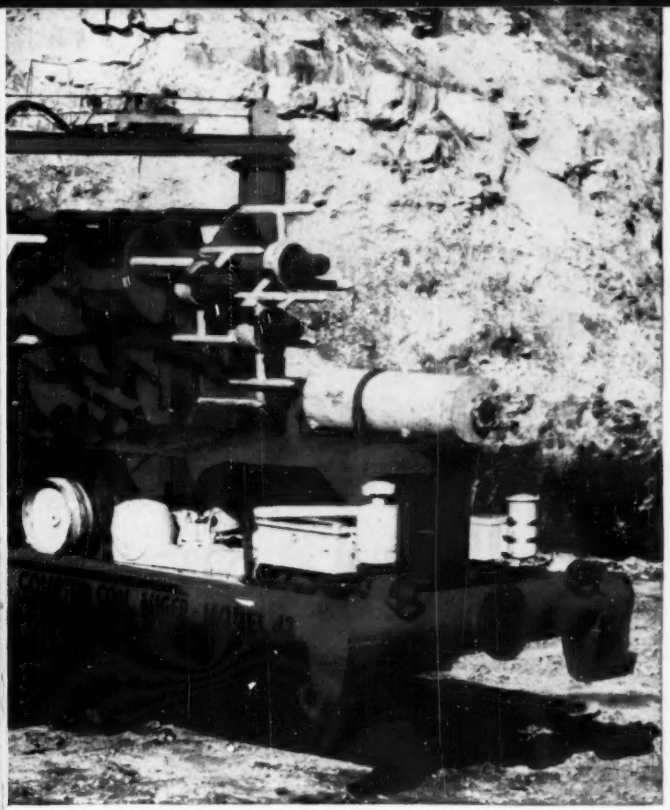
Used in conjunction with your present strip mining equipment you can blend auger mined coal with your regular production and improve the overall quality substantially.

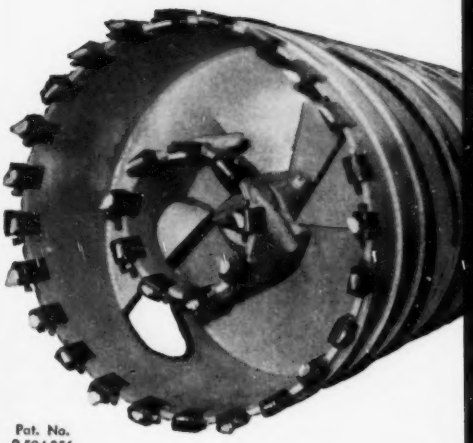
In mines where these machines have been in operation for the past two or three years, the Auger has paid for itself many times. In fact, under normal production conditions it should pay off the investment in six months or less.

From the productive standpoint, the Model 42 shown here has been drilling 42 inch holes to a 189 foot depth and producing up to 500 tons per shift in the Pittsburgh seam. Another example—Nine Compton augers in use by five companies in three states have a total potential capacity of 1,800,000 tons per year based on 200 days of two shift work.

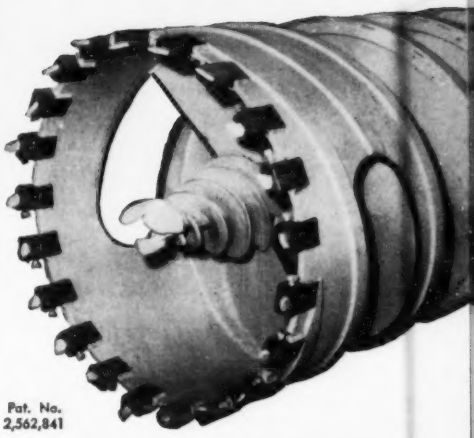
The Model 42 is 42 feet in length—weighs approximately 33 tons—carries nine 21 foot auger sections—requires only a 45 foot minimum pit width—is powered with 225 H.P. Diesel engine—has hydraulic jacks in each of the four vertical frame members which have a lift of 66 inches and permit drilling of overlapping holes—can be equipped with augers from 48 inch to 30 inch diameter.

The Compton Model 56 Auger is 56 feet in length—weighs approximately 50 tons—carries six 34 foot auger sections—requires a minimum pit width of 60 feet—also has a hydraulic lift of 66 inches and permits drilling of single or overlapping holes—is powered by a 300 H.P. Diesel engine—can be furnished with augers from 52 inch to 30 inch diameter—and provides a total drilling depth of 204 feet.





Pat. No.
2,594,256



Pat. No.
2,562,841

MINING...

COMPTON *Non-Clogging* AUGER HEADS

(PATENTED)

The unique cutting heads shown here were designed—developed and built by a coal operating company and their construction adheres closely to long accepted and proved practices of cutting coal. These new cutter heads have two types of core breakers which are interchangeable to meet the requirements of the various seam structures and to produce more and larger lump coal.

The new type heads, capable of cutting coal at high speeds without clogging, assure a continuous flow of coal from head to truck during entire hole cutting operation. Maintaining a constant peripheral speed for all diameters makes it possible to get large tonnages even with the smaller diameter augers.

COMPTON, Inc. ORIGINATORS OF COMPTON LUMP RECOVERY HEAD

Box 1946—Phone 4-6384 **CLARKSBURG, W. VA.**





A. J. Nairn, State Mine Inspector; Harry Sanford, U. S. Bureau Mines, Johnstown District; John K. McCarthy, Gen. Supt., Morrisdale Coal Co.; Clyde H. Maize, Mine Inspector, 20th District; D. C. Jones, Pennsylvania State College.

37th Annual Meeting of the Coal Mining Institute of North America



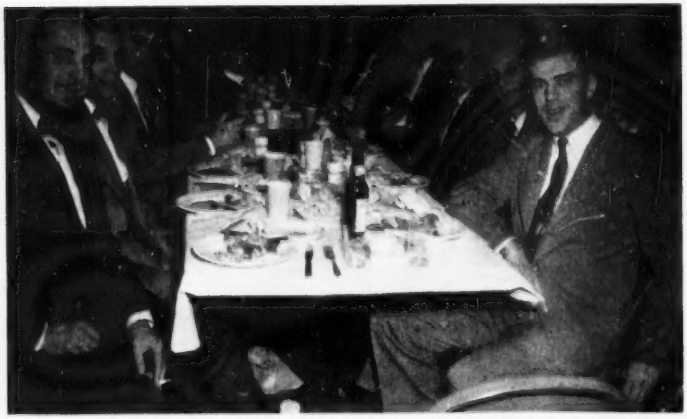




The Coal Mining Institute of North Cambria County, Pennsylvania held its 37th Annual Meeting at the American Legion Home, Barnesboro, on October 25.

The business session took place at 2 P. M. and was opened by an address of welcome by Richard Todhunter, Jr., Burgess of Barnesboro and General Manager of the Barnes & Tucker Co., Dennis Keenan, President of the Institute outlined the purpose of the Institute. J. G. Nicholson, Treasurer for the entire 37 years made a report, then resigned because of his age.

The first paper was about Longwall Mining with the Sampson Coal Stripper, by Richard Todhunter, Jr., and described that type of British Continuous Mining Machine which employs the principle of the farm plow to cut 18 to 24 inch thick strips of coal off the face and drops it onto a conveyor between the ma-



Left to right: J. E. Cole, Penna. Coal & Coke Co.; I. E. Hicks, Barnes & Tucker Coal Co.; J. C. Sharabaugh, Peale Coal Co.; D. K. Kritzer, Federal Mine Inspector, M. H. Mehall, George Dunchak, Walt Crago, Dick Crago, Wm. Todhunter, all of the Barnes & Tucker Co., and D. J. Murphy, Sterling Coal Co.





Left: Walter Meyers, Asst. Gen. Supt., Peale, Peacock & Kerr, Inc.; Joseph Paydock, Supt., Cherrytree Coal Co.; T. L. Stafford, Gen. Supt., Peale, Peacock & Kerr, Inc.; Jack Berkebile, Penn Machine Co.



Left: Wm. R. Kelly, Mining Engineer, Robert J. McCormick Coal Co.; Leo H. Ripley, Supt., Bethlehem Mines Corp.; Elmer Janosko.

chine and the first row of roof support jacks.. Three rows of roof support jacks are used at the operation described. The mining machine is mounted on one hydraulic pack raises the machine off the floor and supports it for the length of its cut, which is about 8 ft. The jack is then let down and the machine is moved to allow for the next cut. At the end of the face the machine need not be turned as it is equipped with cuter head on each end. The conveyor is pushed toward the face after each cut by hydraulic jack, anchored to the roof support jacks.

The second paper on the list dealt with Permissible Electric Equipment by Robt. S. James of the U. S. Bureau of Mines. Another paper on Economics of Coal as Affected by Research, was extemporaneous by J. N. Geyer, Imperial Coal Co. Following that paper was one, Practical Mine Lubrication, by O. A. Schwanke, Hulurt Oil and Grease Company and we are reproducing that paper in this story.

Last year this meeting was flat with the general run of mine papers that have been presented. without change, for many years. This year this program is a model for other institutes to pattern after. Give this list of papers another look and see if you do not agree that it is well rounded out on a pattern that looks at coal mining as it will be in the future.

Without a thin film of oil or grease the coal mining industry as it is known today would be impossible, because the machines on which it is based would be impossible. This precision built high-speed machinery is in service by virtue of the oil and grease developed to lubricate it.

While there are innumerable methods of lubrication in operation throughout the industry, apparently there is no universal method adaptable to all mines. Therefore, it remains as the pattern of mechanical mining unfolds, for each individual mine to develop a suitable lubrication system for the mine and equipment involved.

Considerable advertising copy has been directed to the industry, extoling the merits of this or that particular product. Much of this advertising contains about the same stock phrases, such as, lower maintenance costs, fewer lost time breakdowns, etc. Almost everyone seems to have all the answers to coal mine lubrication, particularly if you will but use their products. Often unusual and fancy names are invented to describe a product and it seems to be the opinion of some advertising men that the more mystery surrounding a lubricant, the greater the powers of magic that lubricant possesses.

Perhaps modern day business with its extreme pressures and keen competition has been partially responsible for these conflicting and confusing claims. As a matter of fact coal mine lubrication is a puzzle on which the key is completely exposed, and the simplicity of it causes the solution to appear difficult.

Practical coal mine lubrication, operates on the theory that "the

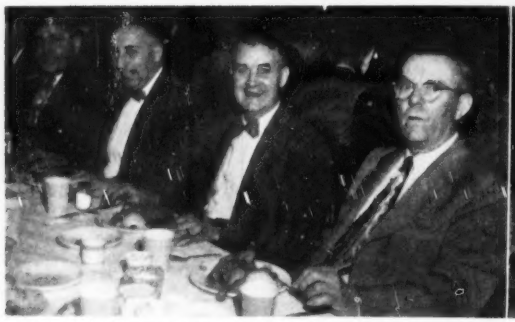




Left: Walter Hunter and Jas. Abram, Rich Hill Coal Co.; James J. McNally, Mfg. Representative; James Froggatt, Supt. Rich Hill Coal Co.



Melvin Rovitch, Robert Strickland, John Flatick, and Sabio, all of the Lenark Coal Co.



Left: C. E. Fisher, U. S. Bureau of Mines; C. L. May, State Mine Inspector; John Thompson; Dwight Thorpe, Foreman.



Left: Chas. L. Barnhardt, Mine Safety Appliances Co.; Edward Hovan, Safety Committee, Sterling Coal Co.; William Patterson, Asst. Foreman, John Sponsky, Asst. Foreman, Sterling Coal Co.

proof of the pudding is in the eating." In the early days, lubrication was considered to be a necessary evil. The opinion prevailed that any kind of lubricant, especially black oil, was good enough. Today, lubrication is the life blood of coal mining equipment.

It would be well to compare oil and grease to blood plasma or whole blood, for both are employed to rescue motion from the hungry claws of destruction. Therefore, this paper has not been written to set forth a theory. It is based on hard cold facts, gathered from the experiences of practical maintenance men, who by the process of trial and error, have adopted five basic steps necessary to an efficient system of lubrication. The more thoroughly each of these steps are developed, the greater the degree of efficiency attained.

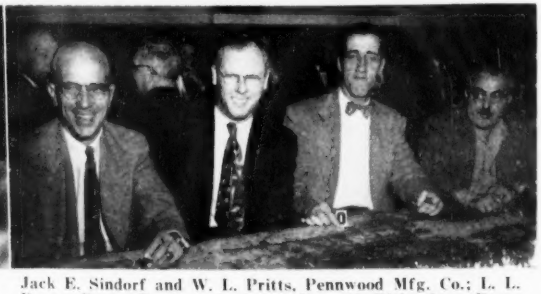
The first step is, **"The selection of lubricants."** It is the aim and desire of maintenance men and lubrication companies to keep the number of lubricants to be used at a minimum. This does not necessarily mean that one or two lubricants should be selected for fifteen or twenty different machines. This was the general belief and practice when black oils were the only lubricants to be found at most mines. The better way to select correct lubricants is by actual tests under everyday working conditions, and these tests should be of a duration sufficient to determine an authentic comparison. Advertising claims, salesmanship and the comparison of samples may induce the original purchase of a lubricant, but the second order will be placed only if the results have been satisfactory. The similarity in appearance of oils and grease and the limited technical knowledge of the purchaser as to the characteristics of them, places the purchaser at a distinct disadvantage. When it comes to lubrication it can be truly said, "a little knowledge is dangerous." The safe way is to make your own tests in your own way.

The second step is, **"the storage of lubricants."** This is by far one of the most flagrant violations of an efficient system of lubrication. There is no major objection to storing unopened drums outside. Where this practice is followed the drums should be placed on a rack or some form of support and resting in a horizontal position. However, a drum should be tapped, only inside an oil house or building suitable for that purpose, and remain there until it has been emptied. Lubrication companies are diligent in their efforts to keep their products free from dirt and foreign matter until they reach the mine. Many lubrication failures have been born outside the mine, simply because dirt has been allowed to mix with the lubricant, thereby transforming a good lubricant into an abrasive compound. A well built and clean oil house is an excellent investment.

The third step is, **"the distribution of lubricants."** This procedure can best be organized by the maintenance men and does not present a major problem, since most mines have little difficulty in getting oil and grease to the sections. However, under this third step is to be found a dangerous pitfall, for at this point you actually begin to spend your money for lubrication. Using and transporting lubricants in battered and filthy containers is a direct invitation to trouble.



Left: Paul Hineman, Asst. Foreman; John Hopson, General Mine Foreman, Charles Richardson, Superintendant and Joe Pesarchick, Asst. Foreman, all of the Johnstown Coal & Coke Co.



Jack E. Sindorf and W. L. Pritts, Pennwood Mfg. Co.; L. L. Panao, Panao Brothers Coal Co.; Kenneth Richardson, Pennsylvania Coal & Coke Co.

Grease guns in the same condition may deceive the most conscientious greaser. Containers, and by containers we mean oil cans and grease buckets, without identification markings are often responsible for costly breakdowns because the wrong lubricant was used in the wrong place. This equipment should be cleaned at least once each week and replaced before it becomes completely usless. Five gallons of oil costs considerably more than a five gallon oil can. We are aware that this may seem to be a trivial matter, but remember we are discussing practical lubrication, and to be practical we must use the products we have selected —at full strength. Where it is possible one man should be held responsible for the filling and maintenance of containers. It is definitely improper practice to allow anyone who happens to need oil to take as much as he wants, when he wants it. The distribution of lubricants means very little unless records are maintained of this distribution. Once this record is maintained and a pattern established, it will be surprising how these figures will fluctuate. Here is simply a telegraphic message telling the maintenance men, and warning them of impending danger. In many instances this will be the key to a mechanical failure—or a lubrication failure.

The fourth step is, **"the application of lubricants."** If the first three steps have been carried out to the letter, there is no guarantee that the fourth step will automatically follow. The first three steps are more or less under direct supervision of company men. In the aplication of lubricants, or to be more specific, the actual job of greasing the machine, it is usually necessary to rely on men who are physically trying to get the coal. They are busy, in a hurry, sometimes careless and sometimes just don't care. But above all they are human beings and as such are subject to human errors. We know that automatic lubricating equipment is designed to give positive application and to remove human errors, but so long as we must depend on men to do this job, we should recognize the responsibility is not entirely that of the man himself. It would be difficult to find a superintendent or maintenance man who has not at one time or another said, "we buy good grease but our trouble is getting them to use it." "We tell them



Charles Long, shop foreman; Steve Shea, asst. foreman; Fred Williams, electrician; Patrick Donahue, chief Elecetrician, all of the Pennsylvania Coal & Coke Co.

and we tell them but it doesn't do any good." Here is a suggestion that might well repay anyone having this trouble, for the fifteen or twenty minutes you have so kindly given this paper your attention. **"Stop telling them."** It is certainly obvious that telling them has not produced results. The best remedy we know to correct a situation of this kind is to substitute this phrase, **"start telling them how."** Remember, as operators you simply convert your money into oil and grease—this man who does the lubricating actually spends your money for these products. Your lubricant supplier has spent millions of dollars to perfect and sell his products, yet the final judge and jury of all his efforts is often that of a man who does not know the first principles of lubrication. These are hard words, yet they are cold facts. tI is not our intention to be critical for we are only discussing a method of lubrication. The chances are that when a machine runner is employed, no one asks him what he knows about lubricating the machine he is to operate. We assume he knows — and that is wrong. It is possible that at the last place he worked, he received no special instructions in lubricating. Very few men will admit they do not know how to lubricate. Instead they make some sort of feeble effort, and if a bearing burns out, they are smart enough to fill it with oil or grease before reporting it. Then the oil salesman is in for a rough time the next time he calls.

Any mine — and we mean any mine — regardless of their lubrication sucesses or failures should hold lubrication meetings or maintenance meetings where lubrication may be discussed from time to time. Following these meetings the maintenance men should go direct to the machine and make absolutely sure the man understands how to lubricate, why he is lubricating and when to lubricate. Most lubrication companies will be pleased to furnish a qualified man to address or lead meetings and some will go underground to teach your men. This is an age of specialization and education. We are already well into an era of coal mining where education is a vital factor. The day is not too far distant when coal miners will have at least a high school education and some will possess college degrees. Teaching and training men to lubricate does not require a long drawn out program. Usually one or two meetings will do the trick, but if it requires additional meetings, by all means continue them. This is not theory, but practical lubrication, and we can assure you that actual experience has proven over and over again, that the results are worth the effort.

The fifth step and final step is **"cost per ton analysis."** These men have spent your money, now you should know how much it costs. It would be of interest to tell you a great many operators have not the slightest idea of their cost per ton for lubrication. When the cost of lubrication is considered to be the original cost, and this is included in the overall maintenance cost — no one knows what lubrication does cost. A separate cost per ton lubrication figure should be on every monthly cost sheet. Once that figure has been established, it would be a good idea to compare it with that of your neighbor — he

might be able to help you, or you might be able to help him.

It is safe to say that once you know what lubrication costs per ton, and you compare it with someone else's cost, you will readily find a way not only to save it, but to take a second look at your maintenance cost. It is not uncommon to reduce a lubrication cost one cent per ton, and automatically reduce the maintenance cost from five to ten cents per ton.

In conclusion it may be said, practical coal mine lubrication is attainable wherever there is a determined effort on the part of all concerned to co-operate and apply equal attention to lubrication.

ANNUAL CONFERENCE ON ECONOMIC RESEARCH HELD AT W. VIRGINIA UNIVERSITY

(Continued from Page 16)

large new investments in machines? What happens to this producer when he is caught with a rising wage cost that cannot be offset by increased price, and no way is open to him to cut costs in other directions? You know the answer to that one.

When it comes to capital expenditure in very large amounts in more mining machines, we have to figure out the expected return on the projected investment. Here is where cost research comes in: here is where economic research based on experience is most valuable.

The coal industry has pioneered with new machinery; such as, cutting machines, loading machines, shuttle cars and now the continuous miner, to get higher production and lower cost. This goes on constantly in all mines in order to improve the manpower productive effort in the face of an ever rising cost per man shift and, in many instances, the falling off of tons per man per shift in spite of the investment in machinery. In addition to this, the coal industry is confronted with competition from fuels which are nearly laborless. Were such fuels available in unlimited supply, the plight of coal would indeed be a difficult one. Be that as it may, no one will dispute the fact that America is industrially great by reason of its abundant supply of coals of all types. The engineering planning and the expense to install the various facilities which go into the production of a ton of American coal are beyond the comprehension of most of us. The final cost of a ton of coal in a railroad car in America is so low, compared with what a ton of coal costs from mines in other countries, that American industry has been fortunate to have had the productive research that has gone into its coal mining over the last fifteen to twenty years. Only by a fair price for the product can this productive effort continue to be improved over the next twenty years.

Labor is not the only cost in mining for we have the cost of operating supplies, electric power, and many others. When it is a question of the cost of the new method of roof bolting for support, we have to figure the cost of that method as compared with the conventional method of timbering. Thus, research for safety and economy again prevails.

When these matters are settled, we still want to know the answers to many other questions, such as, what is the most economic operating time with respect to days and shifts to be operated. What operating time results in the maximum dollar return, and what running time is required to break even? Installed capacity of the mine in the face of shifting markets and the condition of the order book require an almost week to week, if not day to day, scrutiny.

To indicate the complexity of some of these economic problems in the coal business, let us consider the question—what are the steps taken to open a new mine?—and follow through until we have the product ready to deliver to the consumer. We shall exclude the all-important consideration of markets, and in the course of discussion. I believe that we will touch upon most of the other questions and the almost endless ramifications which they present.

Economic research is a prerequisite to the planning of a new mine, else there would be little hope of realizing the most efficient use of manpower, machinery, and capital in order to get maximum production at lowest cost. Early problems that must be resolved include the availability to shipping centers, and, of course, the adaptation of a mining system to natural conditions. There are also the matters of haulage, drainage, and ventilation. This planning cannot be predicated on a year-to-year program; on the contrary, to justify the size of investment needed for a modern mining operation it involves a program projected far into the future.

Several years ago, when the company I represent opened a new mine in Boone County, our planning was for a 50-year life at a definite rate of output. The latter consideration is dependent to a great extent on conditions over which the operator has no control, yet through economic research he is able to set a fairly accurate estimate for planned capacity; otherwise, he would be up against a hit-or-miss proposition. The necessary prospecting to prove this block of virgin coal entailed an expenditure of over a hundred thousand dollars before the construction of the mining plant was even started. We have seen fly-by-night operations that have been highly successful from a financial point of view during abnormal economic periods, but in the long run such operations are short lived and contribute little to the stability of the national economy.

The developing and equipping of a modern mechanized mine involves most of the cost problems of tooling a modern factory, plus many others. Large acreages of coal lands must be bought or leased. How but with the help of economic research could the cost per ton of the production be estimated?

Such considerations are not alone peculiar to a company contemplating the opening of a new mine. They arise periodically for management of old established operations, whether it is a question of sinking another shaft, opening up a new entry, dealing with the vagaries of nature, extending the mechanization process, or investing in new reserves. A mine, unlike a manufacturing plant, has a life limited to the coal which is within reach of it. When the coal is gone, this underground factory has no further use.

The tonnage of coal within reach of a mine is of vital concern when further mechanization is considered. Conditions underground may be ideal for introducing the latest mechanical cutting, loading, gathering and transportation equipment, but the operator must look at the long-term potential before making the investment. Someone

is going to have to decide whether there is enough coal available to justify such a step. True, the operator may have other seam reserves which he plans to mine, but individual seam conditions largely dictate the type of equipment which can be used. Another factor that comes into the picture is that many old mines were laid out and equipped for hand loading, often precluding the economic feasibility of a switch to complete mechanization. And, as if to complicate further the job of economic research, we must always keep in mind the fact that machines of today may be outmoded tomorrow. Perhaps in no field do new machines become obsolete so quickly as in the coal industry. So we not only have to figure how much the machines will cost, how much it will cost to keep them in good working order, how much operating time we can get out of them and how long they are going to last, but whether they are suitable for the mine and the last word in available equipment. You have run into like situations when you start thinking of whether to buy a new car, except that you don't have to worry about whether your neighbor is going to wait a while longer and be able to get a new model that will go twice as fast at half the cost and put you out of business!

No, the answer to higher wages and increasing costs is not always MORE MECHANIZATION. As I mentioned earlier, there is a question of finding the most economic operating time with respect to days and shifts operated, and there are many more questions that relate to labor costs that we hope to have answered through economic research. The cost of labor, even in mechanized mines of today, represents approximately sixty per cent of coal at the mine mouth, another situation for which no parallel will be found in other large industries.

Supplies account for about fifteen per cent of the expenditures in producing coal, and they have to be given the closest attention in a business where we must be so acutely conscious of operating costs. Mines must have on hand an adequate but not excessive stock of all supplies needed to produce coal, and in particular there must be a stock of the critical materials that can result in long production shutdowns if not on hand. But there is an economic limit to the size of the inventory, which experience and availability of supplies will dictate.

There is also the safety element, which is a primary consideration regardless of the expense involved. There are many factors pertaining to safety which may be closely estimated in the annual operating budget with much the same accuracy as are set out in the original capital investment. These factors would include the operation and maintenance of ventilations systems, rock dusting equipment and supplies, timber and roof bolts, wages of safety personnel, and cost of training employees. There can be little doubt that regulations imposed by the safety code must be reckoned with as a new economic factor in coal mining. Such costs cannot be evaluated at this time but are bound to show up on the cost sheet. If they result in safer mining, they are well worth the expense but must be considered as an added cost to the producer and the customer.

Two decades ago we would have given little attention to the preparation of coal in a discussion of this kind, but today the cleaning plant represents a sizeable investment in the coal business. About forty per cent of the bituminous coal produced in this country goes through a preparation plant before it moves to market, and this figure will be substantially higher in the years ahead of us. Coal preparation upgrades the product, gives maximum recovery of marketable coal and makes a saleable product from low-grade seams. For these reasons preparation becomes closely related to production, and any economic analysis of operating efficiency must necessarily take cleaning facilities into account.

In considering the erection of a preparation plant, a company must decide whether it is more economical to have the structure at the mine mouth or at a shipping point also convenient to other mining operations. As in the case of all costly equipment, a preparation plant's net contribution is largely in proportion to the amount of work it can accomplish. Operation at full capacity is the nearest approach to ideal conditions from an economic standpoint.

Now we have our product on the tracks, and I am not going into the transportation of coal and its dependence upon economic research. That is a subject so important and so far-reaching that it should be given special treatment. Obviously, there is a big job in that field.

West Virginia has a tremendous place in the coal production of the nation. Last year it became the largest producer of coal among the states. So much of the reserve tonnage of the nation is wrapped up in the hills of West Virginia that there can be no question in my mind of the place which coal will play in the economic life of the state. Old mines are either gone or are going out of production. Increased costs occasioned by an inflationary trend of all industries will hasten the end of some mines which are nearing their end by reason of limited reserves. However, the vast chemical industry, which is growing up in and on the borders of West Virginia and the dependence of that industry on coal as a raw material or for power, can only mean tremendous new mining operations built and operated along the most modern lines possible as a result of the research which arises out of past experience and such conferences as the one which West Virginia University Department of Economics and Business Administration has arranged for us here today.

There is a challenge to young engineers to do a better job than their forerunners have done in all branches of engineering. There is no more vital challenge than that which is necessary to achieve a better coal product from safer mines at a lower cost from these hills of West Virginia.

It is a pleasure to be part of this conference and I know that I shall enjoy listening to the viewpoints of others who are a part of this program.

CONTINUOUS MINING MACHINE

(Continued from Page 19)

and a portable conveyor is added. Each of these conveyors is about thirty feet long and is mounted on two pneumatic tires located at the rear end. The front end of the portable conveyor is attached to the mining machine, which now will both mine the coal and haul the train of conveyors. At the rear of the conveyor, the cable is plugged in to supply power for the motor that drives the belt. To prevent fouling or dragging the mining machine power cables, each conveyor has large L-shaped hooks on its side for carrying them as they come down from the reels on the second deck of the rig.

As each portable conveyor reaches the end of the platform conveyor, another is added. Actually, this operation takes only a couple of minutes, because the conveyors are brought in overhead by a tractor-mounted crane that suspends each portable conveyor just above the rig conveyor until it is needed. The number of conveyors added depends on the depth of the hole being bored.



CHAMPIONS — The Mine Safety Appliances Company trophy for first place in the 1952 Pennsylvania state bituminous first-aid contest recently at Ebensburg fairgrounds went to the seven-man team for National No. 3 Mine of the United States Steel Company. Awarding the cup to the team captain, J. Ray St. Clair, is C. M. Donahue, manager, Mining Department, Mine Safety Appliances Company, Pittsburgh. Team members in front row, left to right, are: Nick Heirendt, Rudy Renko, J. Jay St. Clair, M. J. Wilkins; in back row, Peter Linden, left, and Joseph Sutts, right. Second-place winner was the team from Robena Slope Mine, United States Steel Company; third, Allison No. 9 mine, Hillman Coal & Coke Company; fourth, Montour Mine 10, Pittsburgh Coal Company. Cash awards and other prizes went to the top four teams. —Johnstown Democrat Photo

THE SECOND CUT

When the machine has bored as deeply as desired, the electric motors are reversed and the machine *pushes* instead of *pulls* its train of portable conveyors. The train is unhitched the same as it was assembled. Finally, the machine itself backs out into the daylight on the launching platform. This part of the operation is much quicker, since the machine can be backed at 30 feet a minute.

If the thickness of the seam warrants, the four hydraulic jacks are let down until the platform is in position to make a second cut below the first. When the seam is not thick enough to permit a full three-foot bite on the ground boring, the coal is kept flowing at the same rate by increasing the forward speed of the machine.

MOVING OVER

When the second cut has reach the depth of the first, the process is once again reversed to remove the conveyors and the machine. With the mining machine on the launching platform, the rig is moved over on its rails so that there will be a wall about three feet thick between the boring just made and the one to be started. In about twenty minutes, the mining machine is ready to take over again.

SOME CONTROLLING FACTORS

When this project was first started, the depth of the holes was limited to 560 feet by the length of power cable. Since then, the cable has been increased to 1000 feet. Right now, the machine is boring 700 foot holes, which is the sum total of the portable conveyors on hand. However, it is confidently expected that this machine could make these 3 by 10 feet holes for over 1000 feet into the hillside.

Nature must also be considered. Variations in the coal face at the outcrop and variation in the seam can dictate the use of different cutting patterns. Sometimes faults in the seam, such as pinching out, limit the depth of boring.

The operators of this machine are always above ground, and they have little or no actual contact with coal. Yet the underground machine they control sends out by way of conveyors up to a ton and two thirds of coal a minute. The size of this coal ranges up to four inches, and the percentage of fines is not materially different from other coal mined mechanically.

During the machine's best eight-hour shift, 567 tons of coal poured off its conveyor. In one continuous twenty-four hour day, it has mined 1200 tons, and in one continuous week, as much as 6000 tons. This production represents a recovery of about sixty-five per cent, and it seems practical to increase this by devising a means for snatching out the three-foot walls between the holes.

● Underwriters' Laboratories, Inc., has listed the "MSA Explosimeter, Model 2," a portable instruments developed by Mine Safety Appliances Company, Pittsburgh, for use in detecting hazarous gas or vapor-air atmospheres. A special filter cartridge, incorporating a chemical reagent, used with the instrument when sampling leaded gasoline vapor, is also listed.

Provided with this light, compact instrument, powered by flashlight batteries, is a sampling line of synthetic rubber, recommended for use in remote sampling of atmospheres which may be explosive.

Full details on the MSA Explosimeter are available upon request to Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh 8, Pa.

● Addition of a new anti-rust phosphate to MELT ice and snow melting chemical is announced by The Chem Industrial Co., Cleveland.

The new formula, developed to safeguard excessive rust in the deicing of pipes, railway switches, gutters, drains, etc., also protects cars, trucks and machinery on loading docks and in driveways and parking lots.

MELT pellets have also been resized for maximum thawing action and are reputed to be 10 percent faster acting. Applied by sprinkling sparingly over ice and snow-covered surfaces, MELT has great covering capacity. If used at the start of a storm, it will melt snow as it falls until its thawing action is entirely dissipated.

New MELT, recommended for industrial use in all ice and snow removal, is also said to furnish traction under spinning car or truck wheels. It is available in 25-lb. steel pails and 100-lb. steel drums. Ton lots are packed in 100-lb. moisture-proof bags.

Write for information to The Chem Industrial Co., 3784 Ridge Road, Brooklyn 9, Ohio.

● A new gold-colored extra high heat resistant paint known as HEAT-REM XG-170 Gold is announced by Speco, Inc., Cleveland.

Made of copper flakes in a silicone base, the new paint will withstand temperatures up to 1700°F, according to the manufacturer, and will "air dry" in approximately 30 minutes.

Because of its high copper content, HEAT-REM XG-170 Gold prevents rust and is resistant to corrosion from mild acids, alkalies and industrial fumes. Upon heating, it is reputed to fuse with the surface of the metal on which it is applied, forming a solid copper coating which contracts and expands with temperature changes.

HEAT-REM XG-170 Gold was developed especially for use on high pressure boilers. It is also recommended for ovens, exhaust manifolds, heat lines, compressors, engine heads, radiators, etc. It is a companion product to Speco HEAT-REM H-170 Aluminum and HEAT-REM Standard Aluminum.

Write for information to Speco, Inc., 7308 Associate Avenue, Cleveland 9, Ohio.

RIVETED JOINTS IMPROVED BY NEW DESIGN FORMULA

By SCIENCE SERVICE

Urbana-Champaign, Ill., Oct. 16—Riveted joints can be 85 per cent as strong as the unbroken metal, according to a new formula painstakingly worked out here by a University of Illinois graduate student.

After conducting 130 tests and studying more than 2,000 others, Frederick W. Schutz, Jr., worked out a means of designing rivet patterns to achieve an 80 per cent to 85 per cent efficiency. Previous efficiencies run around 75 per cent when the patterns are designed by present formulas.

MOVERS of Coal Stripping and Contractor's Equipment



HEAVY HAULING
RIGGING

MOORE-FLESHER HAULING CO.

MOVERS of Coal Stripping and Contractor's Equipment

TWO LOCATIONS

Preble & Adams Sts., North Side, Pittsburgh 12, Pa.
Phone ALlegheny 1-3600

and

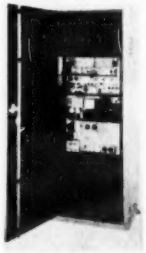
Stoney Hollow Boulevard, Steubenville, Ohio, P. O. Box 547

Motorola's recently announced line of 450 to 470 MC. two-way radio equipment has been complemented by the introduction of a remotely controlled base station.

This newly released equipment is used as an automatic relay station to increase the area of operations of a base-to-mobile communications system or to extend the length of the signal path between the end points of a point-to-point radio relay system. The equipment is also used when it is to be installed in a location some distance from the point of audio termination. Such a condition might be indicated by a high ambient noise level or poor signal propagation characteristics at the most convenient location. Proper location of receiver and transmitter may increase the effectiveness of a system many times.

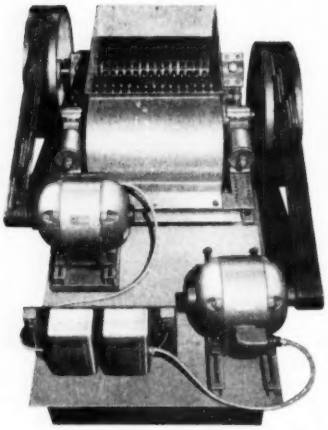
The new base station is housed in a weather-proof cabinet suitable for pole mounting, the same cabinet successfully employed in conjunction with Motorola's 25-50 Mc. and 152-174 Mc. remotely controlled base station.

The components of the new base station equipment incorporate the same exclusive features of the previously released models. These include the Sensicon receiver circuit, the Permakay Filter, Instantaneous Deviation Control and the Capacitance Discriminator.



HERE'S HOW TO SECURE A PRODUCT
MORE PROFITABLE — MORE MARKETABLE

Switch to
SCOTTDALE
double-roll
COAL
CRUSHERS



Designed for higher tonnage output at a savings in power consumption, the shredding action of the crusher's toothed double rolls produces a more consistent product which will boost sales and profits. The Scottdale has forged steel toothed gears; welded steel base, bronze bushed journal bearings; welded steel hopper, grooved flywheels.

NO. 63 SPECIAL — 2 Motor Drive — Produces a Product ¾" to 8". Equipped with Two Grooved Flywheels. (No Gears)

BUY THE BEST . . . *Buy* SCOTTDALE

Send for data and prices

SCOTTDALE MACHINE, FOUNDRY & CONSTRUCTION CO.

DEPT. MC BOX 51 SCOTTDALE, PA.

● A new line of single axle packaged trailer dumps of up to 20 cubic yards capacity is announced by The Galion Allsteel Body Company, Galion, Ohio.

Known as Galion Model 12, the body is constructed of 10 gauge steel. It is 88 inches wide inside and has 32 inch sides and 44 inch ends. Standard equipment includes 12 in. steel removable side boards. Length can be varied up to 18 feet to provide any desired yardage capacity.



Dumping is handled by a Galion Model 77142 Hoist. This consists of two 7 inch twin ram single stage telescopic cylinders. Rated hoist capacity is 18 tons.

The trailer suspension is of heavy duty alloy main and auxiliary springs, one fixed and one adjustable radius rod, with flat top frame section. It is furnished with either a power fifth wheel or wet hose mounting. Tire sizes and brakes are available in several options to meet individual load and service requirements.

This is one of the complete line of trailer bodies and hydraulic hoists manufactured by The Galion Allsteel Body Co.

1. Bay City Shovel No. 65—1¼ yd. Diesel Eng., high front, wide cats. and 1½ yd. Coal Bucket, new in 1948.
2. GMC—75 Kw Deisel Generator with automatic control.
3. Conveyor 39 wide—70 long. Low flight complete with 30 hp and starter. Right Price.
4. Haiss Cat. Track loader, 1949 model.
5. International 18 A-TD Dozer, 1950 Model. TD 14 A Dozer, angle blade TD 6 Dozer, angle blade. Cletrac Dozer, angle blade.
6. 11 BU Joy Loader, new in 1949—Bargain.
7. Joy T1 and T2 Sat. Trucks—CP574 Drills.
8. Goodman Shortwalls and 512 Trucks. Bargain.
9. Joy 8 BU, Myers-Whaley Loaders
10. Ironton 5½ ton Battery Locomotive with Batteries and Charger. Price $2200.00.
11. STEELTITE COMPOUND for water spray systems, for Coal Dust Control. Effective - Efficient - Low Moisture - Low Cost.
12. WHS Ignition Rectifier 275-V Portable 3 cars. Brownie HKL Spot Hoist—New in 1945.
13. Cleveland Stopper with impact Wrench and 1000-1 x 60" Roof Bolts.
14. Slope Hoist Complete with 75 H.P. Motor and Controller. Drum Good For 5,000 7/8 Rope.

T. L. (Les) Simpson

1200 Woodbourne Ave.

Pittsburgh 26, Pa.

Phone Lehigh 1-2254

EQUIPMENT FOR SALE

1 No. 12 Caterpillar Motor Grader

1 1201 Lima High Lift Shovel

13 Euclids 27FDT Bottom Dump

2 D8 Caterpillar Tractors

1 1201 Lima High Lift Sticks and Dipper

1 9W Monighan Dragline

3 Auger Drills—Vertical and Horizontal

7 Water Pumps 2" and 4" Gas Driven

Terteling Bros., Inc.

P. O. Box 631

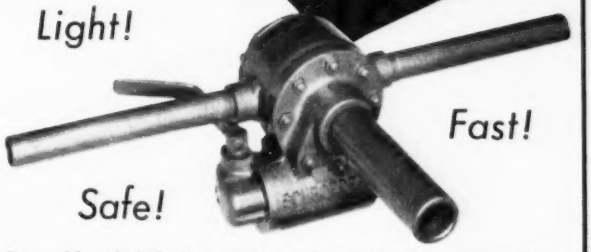
ZANESVILLE, OHIO

Say You Saw It in Coal Mining

here's the *New*

HYDRAULIC hand-operated

SCHROEDER Coal Drill



Powered from the hydraulic power system of standard mining equipment, the Schroeder 12-B Coal Drill provides plenty of power for fast drilling with complete operational safety—never any spark, kick, or shock—all electrical hazards are removed yards from the drill! Lightweight and dependable, its design simplicity and minimum of parts result in greatly reduced maintenance costs. Write or call for details and demonstration.

3116 Penn Ave. Pittsburgh 1, Pa.

SCHROEDER BROTHERS

HYDRAULIC, ELECTRIC & PNEUMATIC MINING EQUIPMENT

Express 1-1571

IT PAYS TO ADVERTISE IN COAL MINING

RELAYING RAIL

TRACK ACCESSORIES

Midwest Steel Corp.

508 Dryden St., Charleston 21, W. Va.

Telephones LD-98 or 21-121

NEW AND REBUILT

STORAGE BATTERY LOCOMOTIVES

Any Size Any Track Gauge

GREENSBURG MACHINE CO.

Greensburg Pennsylvania

PAINTS OVER RUST!

RUSTREM STOPS RUST!

No priming, scraping, brushing



Rustrem paints right over rust. For stacks, fire escapes, bridges, fences, flashings, all metal Farm, Auto, marine, machinery. Black and aluminum

SPECO, Inc. 7308 Associate Ave. Cleveland 9, Ohio

RAILS NEW AND RELAYING

TRACK ACCESSORIES

"FASTER FROM FOSTER"



Try us for all of your rail needs. We're buying daily — replenishing our stocks in all sizes. Complete stocks of All Track Tools & Accessories.

PIPE ✔ PILING ✔ WIRE ROPE & SLINGS

L.B. FOSTER CO.

Pittsburgh 30, Pa. Chicago 4, Ill. New York 7, N.Y. Houston 2, Tex.

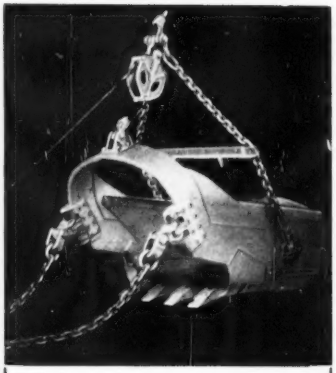
SALEM "HERCULES" AUGERS FOR ELECTRIC DRILLS

Made To Withstand High Drilling Speed, Whip And Torsional Strain Of Electric Drills.



Drills holes faster — Will not snap off shank or chip points — Outlasts four or five ordinary augers

THE SALEM TOOL COMPANY SALEM, OHIO, U.S.A.



Page
Improved
Automatic
Dragline
Buckets

Repairs for ALL Page
Dragline Buckets

McCLURE
EQUIPMENT CO.
3045 Jenkins Arcade
Pittsburgh 22, Pa.
PHONE: COurt 1-5225

MANGANESE
CASTINGS AND SHAPES OF ALL TYPES
Shovel Teeth, Crusher Parts, Shaker Screens, Flats, Rounds, Plates, Welding Rod, Wedge Bars, Repointer Caps, Grouser Bars, Chain, Repair Links.
Geo. L. Wilson & Co.
Office & Warehouse · 310 Mendota St. · Pittsburgh 12, Pa. · CEDAR 1-7710



This "campaign contribution" to Cleaner Air Week came from Miss Elaine Zacker, secretary at the Bituminous Coal Institute, who had the familiar Air Pollution Control Association poster on her office door when the business day began on Oct. 20. Washington itself is one of the best testimonials to the engineering principle that coal can be burned without smoke, for in the nation's capital —one of the nation's cleanest cities—bituminous coal provides more than half of all energy supplied by competing fuels and power.



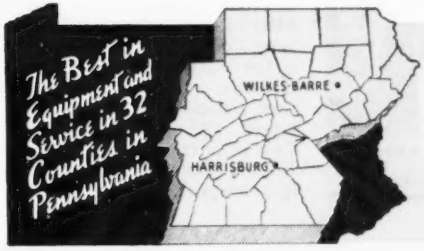
A "Caterpillar" D8 Diesel Tractor and Link-Belt Speeder 2½ yd. Drag Line, powered by a "Cat" D17000 Diesel Engine is shown loading Culm for Coal Reclamation. The job is near Casca and the equipment is owned by the Sanchez Construction Company, Minersville, Pa. This company also owns a "Cat" D7 Tractor and 2 "Cat" D17000 Engines in other shovels.

"CAT"

all the way

Mr. Sanchez went "Cat" all the way years ago. Because all "Cat" equipment is designed and built to work together . . . because many parts are interchangeable . . . because of the outstanding Cleveland Brothers Service . . . standardization on "Caterpillar" equipment paid off for Mr. Sanchez. "Sandy," as he likes to be called, said, "I would not consider anything but 'Cat' equipment."

Standardize with "Caterpillar" equipment and Cleveland Brothers service for lower cost and more efficient operations. For more information, call or write today.



CLEVELAND BROTHERS EQUIPMENT COMPANY

"Caterpillar" Distributors

FRACKVILLE
Route 122, (State Road)
Phone 701

HARRISBURG
Route 322 (Hershey Road)
Phone 6-7981

WILKES-BARRE
Route 309 (Ashley By-Pass)
Phone 2-8141



WOOD TAMPING POLES

For Tamping Explosive Shots: Poles are round made of Hardwood. Sizes to 10 ft. long.

1" Dia.	8c per lineal ft.
1⅛" Dia.	12c per lineal ft.
1¼" Dia.	14c per lineal ft.
1⅜" Dia.	16c per lineal ft.
1½" Dia.	18c per lineal ft.
1¾" Dia.	28c per lineal ft.
2" Dia.	32c per lineal ft.

Special diameters and lengths can be furnished. These Poles meet the requirements of the New Federal Mine Safety Code.

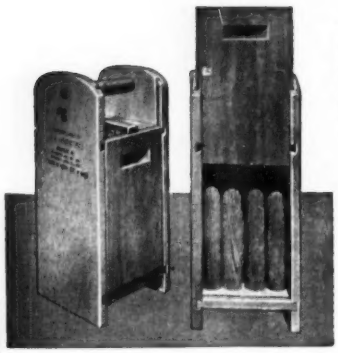


SECTIONAL TAMPING POLES

These Poles are made of straight grained wood and are coupled together with removable wood pins held in place in recessed grooves by a rubber band and can be quickly connected and unconnected.

Couplers and Head Blocks are 4, 5, and 6 inches in diameter. Please specify size when ordering. Poles are 1½ inches in diameter.

Head Blocks	4"	Dia.	$3.70 Ea.
Couplers	4"	Dia.	3.90 Ea.
Poles 12 ft. long	1½"	Dia.	3.60 Ea.
Poles 14 ft. long	1½"	Dia.	4.20 Ea.
Poles 16 ft. long	1½"	Dia.	4.80 Ea.
Poles 18 ft. long	1½"	Dia.	6.30 Ea.
Poles 20 ft. long	1½"	Dia.	7.00 Ea.
Poles 22 ft. long	1½"	Dia.	8.80 Ea.
Poles 24 ft. long	1½"	Dia.	9.60 Ea.



EXPLOSIVE BOXES: Made entirely of wood having no metal parts, tongue grooved and dovetailed construction with automatic lock using a rubber band for a spring, treated with paraffin to make moisture resistant. "Approved by the Pennsylvania Department of Mines." Sizes as listed based on 1¼" x 8" sticks.

Powder Box Prices are as follows:

No. 9 Powder Box	$2.55 Ea.	No. 25 Powder Box	$5.10 Ea.
No. 12 Powder Box	2.95 Ea.	No. 36 Powder Box	6.50 Ea.
No. 16 Powder Box	3.45 Ea.	No. 50 Powder Box	7.40 Ea.
No. 20 Powder Box	3.90 Ea.	No. 72 Powder Box	8.70 Ea.

Detonator Box Prices are as follows:

No. 6 size 2½" x 3" x 6" inside $2.15 Ea. No. 8 size 2" x 2½" x 8" inside $2.15 Ea.

J. V. Hammond Company Spangler, Pennsylvania

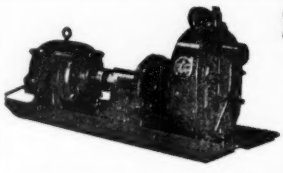
Let Us Solve your DRILLING PROBLEMS!

DIAMOND CORE DRILLING
BITUMINOUS COAL LANDS
TESTED . . . SATISFACTORY
CORES GUARANTEED
HOFFMAN BROS. DRILLING CO.
Punxsutawney, Pa. Call 382

"WE LOOK INTO THE EARTH"

CORE DRILLING
- Coal Property Testing
- Pre-Grouting Mine Shafts
- Mine Drainage Bore Holes
- Large Diameter Holes for Ventilation & Escapeways

PENNSYLVANIA DRILLING CO.
PITTSBURGH 20, PA.



MARLOW
SELF-PRIMING
CENTRIFUGAL
GATHERING
PUMPS

Complete Line Carried in Pittsburgh Stock. Tel. HU 1-4400

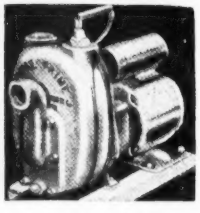
HARRIS
PUMP AND SUPPLY COMPANY
Brady & Sidney Sts. Pittsburgh 3, Pa.

LEWIS
The Selenium Rectifier
Distributors
S. E. GANE & CO. 508 Grant St. Pittsburgh, Pa.

INCREASE YOUR PRODUCTION
with
DALY'S IMPROVED COMBINATION MINE CHECK
The Only Satisfactory Check on the Market Today
DALY TICKET CO., Collinsville, Ill.

Self-Priming Centrifugal ***Pumps***
for Gathering Service
PUMPS — MACHINERY — SHOP EQUIPMENT

Tranter
MANUFACTURING COMPANY
105 WATER STREET • PITTSBURGH 22, PA. • COURT 1-0600



Cap. 3,000 to 200,000 G.P.H.
Engine or Motor Drive

Mr. Storms was appointed as sales representative in Clinton, Lycoming, Tioga, Bradford and Sullivan Counties by Cleveland Brothers Equipment Company. After graduating from Muhlenburg College, he spent four years in the Marine Corps, two of these overseas. Since the war he has been associated with the building supply and equipment business. Russ is married, has one 8 year old son and plans to make his home in Williamsport, Pa.

COAL MINING

NOVEMBER, 1952

Allis Chalmers 6-7
Agency—Bert S. Gittins

Baldwin Machine Co. 5
Agency—Arnold Andrews

Beckwith Machinery Company 2-3
Agency—A. D. Walter, Inc.

Cleveland Bros. 33
Agency—Charley Krone

Compton, Inc. 20-21

Connellsville Manufacturing and Mine Supply Company 8
Agency—McHenry-Derek Agency

Cummins Engine Co., Inc. ..... 3rd Cover
Agency—Needham, Louis & Brorby, Inc.

Daly Ticket Company 34

Euclid Road Mach. Co. 10
Agency—Bayless-Kerr

ESCO Electric Steel Foundry 9

Foster Company, L. B. 31
Agency—Lando Advertising Agency

Furnival Machinery Company 4
Agency—Arnold Andrews

Gane & Co., S. E. 34

Green Mach. Co., A. T. 5
Agency—Arnold Andrews

Greensburg Machine Company 31

Hammond Co., J. V. 34

Harris Pump & Supply Company 8-31

Highway Equipment Company ..... 1st & 4th Cover
Agency—Palm & Patterson, Inc.

Hoffman Bros. Drilling Co. 34

Jeffrey Manufacturing Co. 12-13
Agency—Byer & Bowman

Kanawha Steel & Equipment Co. 9

LeRoi Company ..... 2nd Cover
Agency—Hoffman & York, Inc., Advertising

LeTourneau 4-5
Agency—Arnold Andrews

McClure Equipment Company 32

Midwest Steel Corporation 31

Mine Safety Appliances Co. 36
Agency—Ketchum, McLeod & Grove, Inc.

Moore-Flesher Hauling Company 29

Osgood Company 35

Pennsylvania Drilling Co. 34

Salem Tool Company, The 1-31
Agency—Meek & Thomas, Inc.

Schroeder Bros. 31
Agency—McHenry-Derek Advertising

Scottdale Machine Foundry & Construction Co. 30
Agency—McHenry-Derek Advertising

T. L. (Les) Simpson 31

Speco, Inc. 31
Agency—Palm and Patterson, Inc.

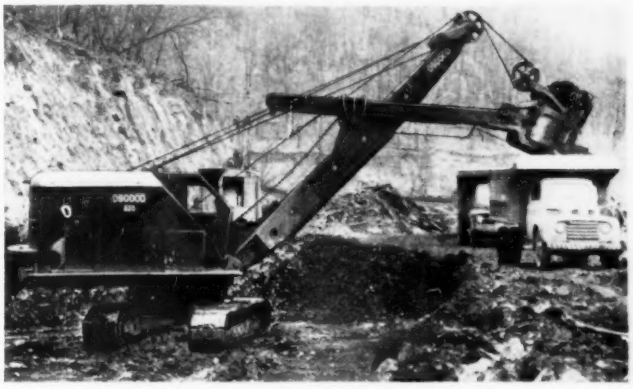
Stiffler Industrial Lubricants Co. 8

Terteling Bros., Inc. 31

Tranter Mfg. Company 34

Wilson & Co., Geo. L. 32

OSGOOD



Cuts loading costs at strip mines

Mine after mine reports loading costs down and profits up when OSGOOD Air-Controlled Shovels go on the job. Digging and loading cycle is accelerated . . . trucks are filled with record speed . . . maintenance is negligible.

Photo shows a Model 820 owned by the Zimnox Coal Co. of Steubenville, Ohio. This machine is equipped with the famous OSGOOD Air Cushion Clutches that assure the smoothest operation since steam and eliminate the many daily time-consuming adjustments necessary on other machines. It has a 26-ft. boom, 20-ft. handle, 1 ½-cu. yd. dipper, 13-ft. 5-in. crawler, and 31-in. tread. Shovel adapts quickly to dragline, crane, clamshell, or hoe. Write OSGOOD today for more information.

EQUIPMENT DESIGNED WITH YOUR PROFIT IN MIND

INQUIRE FOR SALES AND SERVICE INFORMATION

HAZLETON
George P. Greene
Conyngham
Phone: Conyngham 2561

DOVER
Weaver Truck, Tractor & Body Corp.
2405 N. Wooster Ave.
Phone: 4-2391

PITTSBURGH
United Sales Corporation
7620 Meade Street, Wilkinsburg
Phone: Churchill 1-1313

HUNTINGTON
Porter Supply Co., Inc.
1703 Seventh Ave.
Phone: 2-6651

PHILADELPHIA
James G. Hoag
105 Wilford Building, 33rd and Arch Streets Phone: EV-63768

100 YEARS OF ENGINEERING PROGRESS

OSGOOD O-G GENERAL

MARION, OHIO

WORLD-WIDE SALES and SERVICE THROUGH BRANCHES and DISTRIBUTORS

For Extra Trips—
Extra Tonnage—
Extra Safety—

Keep your haulage
AHEAD of PRODUCTION
with the M·S·A
MinePhone
COMMUNICATION SYSTEM



With mechanization increasing production, your haulage system must "keep ahead" to realize maximum tonnage. The M.S.A. MinePhone helps fill this need by providing a modern underground system that maintains smooth, continuous trip movements throughout the mine.

Sending dispatcher's orders instantly and simultaneously to all motormen, who can reply or communicate with each other while trips are in motion, the M.S.A. MinePhone coordinates haulage movements with production demands. Messages, transmitted on an "open line" hook-up, keep the track ahead clear for outgoing loaded trips and incoming "empties."

The M.S.A. MinePhone brings greater underground safety, too. Track conditions, derailments, or roof falls can be reported immediately. Time-consuming calls to each individual are eliminated—a big advantage in emergencies. Write today for complete details on this modern, two-way voice communication system.

MSA
SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M.S.A. is at your service. Our job is to help you.

MINE SAFETY APPLIANCES COMPANY
BRADDOCK, THOMAS AND MEADE STS., PITTSBURGH 8, PA.
At Your Service: 66 Branch Offices in the United States

MINE SAFETY APPLIANCES CO. OF CANADA, LIMITED
Toronto, Montreal, Calgary, Winnipeg, Vancouver, New Glasgow, N.S.
Representatives in Principal Cities in Mexico, Central and South America
Cable Address: "MINSAF" Pittsburgh



Men who depend on power...know they can depend on CUMMINS®

Every CUMMINS DIESEL is built not once but twice



Miners have learned to count on Cummins Diesels for dependable power day in, day out. What's behind this consistent reliability? One good reason is the fact that every Cummins Diesel is actually built *twice*. After initial assembly, and run-in testing, every engine is disassembled, inspected; then reassembled and tested again.

This extra care—together with Cummins' economy-proved fuel system and efficient parts and service organization—makes lightweight, high-speed (50-550 h.p.) Cummins Diesels a wise first choice *for men who depend on power.*

Whatever your power needs . . . whether it's for stripping or hauling, portable power units or generator sets . . . or any other important jobs . . . your Cummins dealer is the man to see.

CUMMINS ENGINE COMPANY, INC., Columbus, Indiana

Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: CUMDIEX

CUMMINS Diesel

TRADEMARK REG. U. S. PAT. OFF.

Leaders in lightweight, high-speed diesel power!

PHILDELPHIA. Cummins Diesel Engines, Inc.: 209-13 North 22nd Street, Philadelphia 3, Pennsylvania. Telephone Rittenhouse 6-4460. Branches: Heffman Boulevard and Chestnut Street, Ashland, Pennsylvania; 6501 Hamilton Avenue, Pittsburgh 6, Pennsylvania; 614 Light Street, Baltimore 30, Maryland . . . **Dover, Cummins Diesel Sales Corporation of Ohio:** 113 North Wooster Avenue, Dover, Ohio. Telephone 42351. Branches: 3827 Spring Grove Avenue, Cincinnati 23, Ohio; 741 Grandview Avenue, Columbus 8, Ohio; 3560 East 93rd Street, Cleveland 5, Ohio; 2883 West Market Avenue, Akron, Ohio . . . **CHARLESTON, Cummins Diesel Sales & Service, Inc.:** 1607-1609 Kanawha Boulevard, Cut-off West; Charleston 30, West Virginia. Telephone Capital 27-178 . . . **LOUISVILLE, Cummins Diesel Sales of Louisville, Inc.:** 2209 Taylorsville Road, Louisville 5, Kentucky. Telephone Cherokee 2616, 2617, 4621 and 4622 **(3-20-52)**

MAKE *Highway* YOUR HEADQUARTERS FOR LIMA SHOVELS AND EVERY TYPE OF EFFICIENT MINE MACHINERY



Serventi Coal Co. . . . Waltersburg, Pa.



E. N. Turner & Sons . . . Harrisville, Pa.



L. W. Overly . . . Smithton, Pa.



Hansel Coal Co. . . . Madera, Pa.



Mottern & Thompson., Philipsburg, Pa.



McCombie Coal Co., Barnesboro, Pa.



Diamond T Stripping Co., New Milport, Pa.



Frank Pulford., Punxsutawney, Pa.



Lonkie Bros. . . .
Glen Campbell, Pa.

Lima Shovels, Cranes, Draglines — used by leading operators everywhere — are typical of the fine equipment sold, serviced and guaranteed by Highway.

See your Highway representative today. He'll be glad to discuss your problems — to help you boost your production and profits.

Highway EQUIPMENT COMPANY

6465 Hamilton Ave. • Pittsburgh, Pa.

ALLIS-CHALMERS • JAEGER • BAKER • HOUGH • GAR WOOD • MASTER • THOR • WAYNE CRANE • GENERAL MOTORS DIESEL ENGINES • LIMA SHOVELS, CRANES, DRAGLINES • ERIE BINS